Something Out of the Ordinary?

Interpreting Diversity in the Early Neolithic Linearbandkeramik and Beyond

Edited by
Luc Amkreutz, Fabian Haack,
Daniela Hofmann and Ivo van Wijk

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PREFACE

ALASDAIR WHITTLE

As the late, legendary American baseball player, Yogi Berra, put it, “when you come to a fork in the road, take it”. In the context of LBK studies, it was Pieter Modderman who put up the first really clear road sign signalling the avenue of exploring diversity. For quite a while, the LBK research community seemed slow to react, perhaps unsure which fork to go down. But for some time now the traffic has been flowing in the right direction and this volume underlines that welcome trend in a very timely and helpful way.

LBK research presents a number of distinctive challenges. While the archaeological evidence for LBK communities is so widespread and so easily recognizable, its very abundance, still increasing, makes it hard for any one specialist to make sense of it all. There is then the danger of seeing the LBK as “fractal”, as the same thing over and over again. There is the temptation to apply single, big models—one size fits all—as we have seen over the years with the *Hofplatzmodell* (or single homestead or yard model), and to some extent with the notion of patrilocality, and may be witnessing again now in the form of the house societies model. There is also the risk that specialists in any given place will be content simply to unravel local or regional situations, and leave it at that. I think that all these tendencies should be resisted, because to give in to them is to throw away some of the most interesting dimensions of the LBK, which include what is shared across vast areas and how, and what is not and why. Was there ever a total LBK world which any one person of the time could grasp? Perhaps not, but familiar-looking—even if not identical—buildings, gardens, crops, animals, pots, and stone tools must have been encountered by anyone travelling widely in the later sixth millennium cal BC, and people away from home might well have known how to fit in at the gatherings and funerals of others; it may all have also sounded familiar, depending on issues of language and dialect. So it is the relationship between shared practice and widely held beliefs and values on the one hand, and local and other ways of doing things on the other, that seems to me to really matter. This set of new papers, which seek to unpick diversity and variability, from an impressive range of perspectives, is therefore important.

Writing a preface is a bit like being the *compère* of a music hall act: enthuse the audience, tell a joke or two, and build up anticipation, but don't get involved with the performance. In the case of this LBK variety show, as I read the papers, I wanted to respond to and engage with each single contribution. I am sure other readers will react in the same way.

—Cardiff, 27.10.2015

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INTRODUCTION

CHAPTER ONE

INTRODUCTION: DIVERSITY AND UNIFORMITY IN LBK STUDIES

DANIELA HOFMANN, LUC AMKREUTZ,
FABIAN HAACK AND IVO VAN WIJK

The Linearbandkeramik, as the first farming culture over a vast area between the Ukraine and the Paris Basin, and between Hungary and the North European Plain, has long fascinated researchers. Its quick spread from a core region in Hungary and Austria, its enormous geographical reach and the similarity of its material culture traits, from pottery and stone tools to houses, the basics of an agropastoralist economy and burials, have made it something like a brand: a phenomenon with a high recognition value and with a large impact on people's lives in the past.

Yet like with any brand, the way the LBK has been viewed and interpreted is constantly under revision. One core issue has been the relation between the large-scale material culture similarity and the role of regional and local differences which increasingly came to light. The relative explanatory weight accorded to these opposed poles of uniformity and diversity has shifted repeatedly, but so far no satisfactory resolution has emerged. Is there, in the face of increasingly fine-grained patterns of divergence at ever smaller scales, even such a thing as a "LBK culture"? Or is a focus on diversity just an obsession with detail which distracts us from the important parts of the bigger picture? This is the debate to which the present volume seeks to contribute.

In this introduction, we begin by outlining, in necessarily broad brush strokes, the changing fortunes of "diversity" as an explanatory concept in the LBK. We then draw out some of the connecting themes which cross-cut the papers presented here and especially reflect on how the inclusion of additional case studies beyond the LBK, which grapple with a similar tension between diversity and uniformity, can inform further research on the Early Neolithic of central Europe, but also more generally on the archaeological entities we term "cultures".

Diversity

Identification of the LBK as a unified culture was a step-by-step process. The culture as such was already defined in the late nineteenth century and the term *Bandkeramik* coined by Klopfleisch in 1883. In the following decades of the twentieth century, scholars in different countries and regions identified their finds (often originally referred to by terms such as *Spiralmäanderkeramik*, *Omalien* and so on) as being part of this cultural unit. Once the LBK had thus coalesced, and once its chronological relationship in the European culture sequence had been finally established as lying early in the Neolithic sequence, one of its main virtues was the ease with which it could be accommodated into the prevailing culture-historical models of that time. The contrast between it and the preceding, mobile Mesolithic way of life seemed overwhelming, and so there was little reason to doubt its spread by a form of population movement, initially connected to the exigencies of slash and burn cultivation. This was indeed a "people", an ethnic unit carrying with it not just a few items of material culture, but an entirely new way of life. In Childe's memorable quote, this was "a Neolithic population whose whole culture down to the finest details remains identical from the Drave to the Baltic and from the Dniestr to the Meuse" (Childe 1976, 105).

With the post-war period and the beginning of large-scale fieldwork projects in several European countries—perhaps most notably the long-running excavations in the French Aisne valley (Ilett 2012; Ilett *et al.* 1982), on the Aldenhovener Platte of the German Rhineland (e.g. Stehli 1994) and in adjacent Dutch Limburg (Modderman 1970), and at Bylany in the Czech Republic (e.g. Pavlů 2000; Soudský 1962)—the wealth of information on the LBK increased exponentially. It became—and still is—impossible for a single researcher to keep abreast of the new and ever more detailed information generated everywhere. This increasing mass of detail led to diversity at two different levels. On the one hand, as part of the general development of prehistory as a discipline, regional and national research foci began to differ to an extent. On the other hand, and perhaps not entirely unrelated, regional and chronological diversity in the archaeological material began to move centre-stage.

The definition of the Earliest LBK by Quitta (1960) and Tichý (1961) is one such example and opposed an early horizon of flat-based, generally thicker and organically tempered wares with simpler decoration to a later phase with more inorganically tempered, round-based vessels which could be very finely made and elaborately decorated. It also became clear that the spatial extent of this earliest LBK phase was reduced and that in turn material culture was comparatively more uniform than later on (Cladders and Stäuble 2003). It is only from the succeeding Flomborn/Ačkovy phase that the Rhine is decisively crossed, and the LBK reaches as far as the eastern Paris Basin, with a further westward spread later on (Billard *et al*. 2014, 333–338; Ilett 2012, 69). From Flomborn onwards, regional diversity increases apace and becomes particularly pronounced towards the end of the LBK, when a variety of regional decorative styles and techniques (e.g. comb impressions) are in use (e.g. Jeunesse 1995; Meier-Arendt 1972; Pechtl 2015; Strien 2000, 66–71).

One main way in which these differences could be and were used was to refine the chronological fine-tuning of the LBK sequence. This kind of operation generally implies a unilinear trajectory, mostly from simple to more complex, and in the case of the LBK also to more idiosyncratic, decoration. The guiding assumptions are that a new motif will be introduced slowly, reach a peak and then "fade out". While the mechanisms by which new motifs were introduced could be varied, in practice the question of why this stylistic divergence began and progressed has only just begun to be tackled for the LBK (see Pechtl 2015 on pottery; more generally: Van de Velde forthcoming). Implicitly, then, regional difference was generally treated as analogous to a process of genetic drift: pottery simply became more different over time, as random "copying errors" were introduced (although interestingly, formal modelling from an evolutionary perspective suggested that simple drift was unlikely to explain the observed pattern, see Shennan and Wilkinson 2001).

In addition to pottery, other items of material culture were recognized as showing increasing regional divergence over time. To name but one example, houses of the developed LBK look rather different to those of the earliest phase, and within the later horizon there are distinct regional preferences for certain kinds of post settings and orientation, as well as in the average size of the buildings, the ease with which internal partitions can be identified, and so on (e.g. Coudart 1998; Modderman 1970; 1986). Although buildings are readily accepted as being closely connected to people's way of life and worldview (for the LBK e.g. Bickle 2013; Hofmann 2013; Veit 1996, 63–67; Whittle 1996, 162–166; 2003, 136–141), the models proposed for architectural diversity did not actually differ all that much from those for pottery. Decreasing post densities over time were connected with increased building efficiency (Modderman 1970, 119), while otherwise the appearance of regional diversity remained undertheorized. In addition, there was a counter-tendency in seeing architecture, and particularly the organization of site space, as a powerful unifying factor of the LBK, starting with Hodder's (1990) ideas of a specific worldview expressed in "the" LBK longhouse and ending with the widespread and inter-regional application of the "yard model" of Bandkeramik settlement development (Boelicke 1982; Kuper *et al*. 1974; Zimmermann 2012).

As similar debates developed regarding differences in burial customs, economic preferences, knapping styles and the use of personal ornaments, a new consensus regarding the role of diversity in our interpretations of the LBK began to emerge. An important role here was played by P.J.R. Modderman, one of the founding scholars of LBK research in Europe. Based on his meticulous contributions on the LBK in Dutch Limburg, he developed important typo-chronological systems for pottery and house typology, which—albeit slightly refined—are still at the heart of many studies into the LBK (Modderman 1970). By their inherent logic, these typologies in themselves also helped to reinforce the idea of a very structured and uniform set of practices and material culture within the LBK by providing the tools to categorize and analyse them. Yet, at the same time Modderman stressed the opposite, the overall diversity underlying the apparently uniform LBK cultural complex. In his seminal paper "Diversity in uniformity" (1988), he drew attention to the many characteristics of the LBK that were not the same throughout, ranging from the frequency of tripartite longhouses, the choice of personal ornamentation, or the kinds of flint tools in use to physical diversity between cemetery populations and possibly even differences in social organization. Reflecting on the geographical and social dimensions that may form the basis of this diversity, Modderman (1988, 130) concluded that "different solutions were chosen for problems that were not identical everywhere". Yet at the same time, he insisted that many of the differences he detected, especially in later LBK phases, were "no more than the gradual changes that can be expected in any human society" (Modderman 1988, 130).

Overall, then, a certain ambivalence remained, and indeed looking closely, the kinds of diversity that Modderman defined throughout his text are of very different orders. Sometimes, they concern regionality, at other times chronological differences. In the case of burial grounds, these can be combined: the need for cemetery burial arose with increasing territoriality, and this may not have affected all regions equally (Modderman 1988, 73). At other points, individual or idiosyncratic factors are stressed, such as where differences in economic success between settlements are attributed to the skill and shrewdness of the inhabitants (Modderman 1988, 88). "Diversity" thus came to cover everything from accidental drift to flexible reaction to local environments, from the continuation of local Mesolithic traditions to the emergent properties of weakly hierarchical social systems, and from individual preferences to group organization. The relative importance of geography, historical trajectories and individual inventiveness differed with each aspect considered, but one single term was used to cover them all. In this way, it became difficult to disentangle the different factors contributing to "diversity". This problem is also stressed by Lenneis (2012) when she points out that typological schemes drawn up for the western LBK are often used to classify material from the "core regions" of early settlement further east, potentially conflating regional diversity and chronological changes.

In spite of these issues, this general re-orientation towards identifying "diversity" proved to be immensely creative in the following decades and its appearance on the interpretative scene of LBK archaeology—and beyond—was warmly welcomed. This is perhaps partly because its wide scope allowed its application to many different kinds of phenomena, at many scales. It enabled the search for a deeper understanding of Early Neolithic development within a regional context, re-aligning the debate by characterising LBK Neolithization as a mosaic process from the start. The problem, then, was not the introduction of diversity itself—indeed, the framework Modderman built was invaluable for moving forward the debate—but the lack of any clear definition of its nature.

Another important factor certainly was that its core idea of granting a more active role to the hitherto neglected indigenous, pre-LBK population seamlessly aligned itself with wider trends in Neolithic research, and with a shift in archaeological theory generally, in which the role of small-scale differences and agent-based narratives became increasingly important. Especially in the Anglophone literature, a certain migration scepticism had long set in and was if anything further engrained with the emergence of post-processualist approaches (as criticized e.g. in Anthony 1990; Chapman and Hamerow 1997). Put very simply, this resulted in a general outlook which valued the recognition of diversity in the archaeological record as a sign for the active role of people in appropriating, rather than passively perpetuating, forms of material culture. Diversity became equated with agency. In the Neolithization debate in particular, this was also explicitly connected to the indigenous adoption (rather than foreign introduction) of an agricultural way of life. Putative colonisers would hence be expected to import their material culture more or less unchanged and to establish it rapidly. In contrast, slow adoption, experimentation, and the introduction of changes reflect the choices of people actively selecting a new kind of lifestyle (as e.g. discussed in Robb and Miracle 2007, 100–103).

Put a little starkly, this can be summarized as follows:

Diversity : Uniformity
Agency : Structure
Hunters : Farmers

Archaeologists began to exploit work generated in other social sciences to discuss issues of creolization, the creative fashioning of new identities, and various forms of resistance. But in spite of the sophistication of some of these ideas and the work resulting from them, as well as sustained criticism regarding the prevalence of dichotomous thinking (e.g. Pluciennik 2008; Robb 2013; Robb and Miracle 2007; Thomas 2015; Whittle 1996, 355–360), these basic sets of opposites remained deeply engrained. Even recent attempts at resolving them have often ended with trying to assign a specific practice, such as wild plant use or fishing, to one or the other side in the equation, with any transgression seen as proof of Mesolithic involvement in a gradual Neolithization process (e.g. Cummings and Harris 2011; Jones and Sibbesson 2013).

This new and very productive set of assumptions was not limited to the post-processualist paradigm, as across central Europe similar arguments began to be made. The culture historical narrative, which opposed two peoples with differing material cultures, could be usefully extended to oppose two peoples with different capacities for material culture innovation: conservative foreign farmer-colonizers and creative local hunter-gatherers. Soon, the first studies along these lines began to appear specifically for the LBK (Jochim 2000; Kind 1998; Tillmann 1993; Whittle 1996, 150–152; for a summary see Scharl 2004, 57–81). In the last couple of decades, the emerging new consensus has been of leapfrog colonization, whereby some farmers migrated into central Europe and established enclaves, which acted as centres of secondary Neolithization. As this second step was largely carried by the indigenous population, diversity began to emerge (e.g. Gronenborn 1999).

While diversity was thus accorded a guiding explanatory role for our understanding of the LBK culture, the question is whether our vision of it had really changed so fundamentally. “The” LBK was still seen as intrusive, conceived as an almost pathologically uniform (Keeley 1992, 82) cultural and mental unit originating somewhere far off, and then later merely adopted by others. Only these others had the capacity to be inventive. In some cases this was explicitly seen as resistance to the otherwise stifling norms of colonisers (e.g. Jeunesse 2009). But even where this was less clearly formulated, these narratives generally assumed a LBK "norm" (realized in a never really specified location "elsewhere" from one's current study area), from which "deviation" could then be defined. This deviation was most often creative difference, and occasionally negatively valued as denoting lower status and/or irreverence (most notably in the burial context; see discussion in Veit 2013). Both these options were mostly seen as reflecting the existence of a population group different from the LBK, irrespective of the actual density of Final Mesolithic settlement in any given area.

The so far final twist in this tale has come with the more widespread application of aDNA to Linearbandkeramik burials, which has unequivocally shown the large role played by a new, incoming population (e.g. Brandt *et al*. 2013; 2014; Haak *et al*. 2010; Szécsényi-Nagy *et al*. 2014). The role of indigenous people seems to have been negligible, and this although they apparently survived alongside LBK communities, at least in some regions (e.g. Bollongino *et al*. 2013; Crombé *et al*. 2015; Pokorný *et al*. 2010; Stäuble and Wolfram 2013). Of course, problems still remain, for example the lack of burials from both the latest Mesolithic and earliest LBK phases, which leave a rather large chronological gap during which population replacement could have happened, and the regional imbalance in the skeletal material sampled so far (Degouilloux *et al*. 2012; Hofmann 2015). Especially the more westerly areas of the LBK distribution, where the role of hunter-gatherers was generally thought to have been stronger, have as yet received little attention (and some of course have hardly any preserved human skeletal material to begin with). Nevertheless, it is clear that we must now seek to find alternative models for explaining diversity which do no longer rely on opposing two populations, one culturally dominant but conservative, the other somewhat overpowered, but defiantly creative. We must seriously consider the option that material culture diversity emerged from the dynamic interactions within the entity we call "LBK", and between it and its social and environmental surroundings (see below).

The papers

It is this set of problems that our authors grapple with, using as their starting points very different kinds of material culture and different scales of analysis. Beginning with daily life and domestic dwellings, Jaromír Beneš and colleagues trace the new world views embedded in the LBK longhouse and in its transformation to Middle Neolithic buildings, using the site of Hrdlovka in the Czech Republic as their main example. Lech Czerniak's contribution is similarly rooted in a regional case study, this time of Little Poland, which forms the starting point for a sustained critique of prevailing models of LBK house construction and settlement organization. Focusing on the implications of isotopic evidence for diet and mobility, Penny Bickle concludes this section by showing how these aspects were differently refracted at different social scales.

The subsequent section on material culture includes two papers on lithics and two papers on pottery. In the first set, Jarosław Wilczyński and Marjorie De Grooth trace the changing networks of raw material procurement, for Poland and the Dutch Graetheide respectively. In both cases, an initially relatively homogenous network diversifies over time, as traced at a more regional scale by Wilczyński and down to the level of individual households by De Grooth, prompting questions regarding the mechanisms and social implications of these changes. Barbara Van Doosselaere and colleagues provide a fine-grained study of the *chaîne opératoire* of pottery production in the Belgian Hesbaye at the transition between the LBK and the local Middle Neolithic culture, the Villeneuve-Saint-Germain, showing the complex intersections between ways of pottery shaping and decorative traditions. In her contribution, Daniela Hofmann focuses on why the coexistence of hunter-gatherer-produced pottery, notably the La Hoguette phenomenon, and LBK pottery worked out differently in different regions and concludes that this is the result of the intertwining of two equally dynamic strands into one field of action.

The following, shorter section combines two papers on burial evidence, both of which focus on unique practices far removed from the interment of single bodies in cemeteries or settlements. Maciej Dębiec traces the possible ritual sequence of a single mortuary rite carried out at Niezvisko, Ukraine, where an adult male was buried surrounded by an array of features and artefact deposits. This provides clues to the kinds of social relations which may have led to this unique display. In their reinterpretation of the famous enclosure at Herxheim in the Rhineland-Palatinate, where the bodies of several hundred people were fragmented and deposited with destroyed items of material culture over a period of less than a generation, Andrea Zeeb-Lanz and Fabian Haack also stress the uniqueness of this ritual response and attempt to contextualize it within the transformations at the end of the LBK.

The next set of papers moves away from specific sites or artefact categories to consider evidence at a regional scale. The contributions by Joachim Pechtl and Anne Hauzeur offer two very different takes on diversity at this level. For Pechtl, material culture in Lower Bavaria is deliberately deployed to draw boundaries between entities he characterizes as ethnic groups, while in the case of Luxembourg Hauzeur blurs the divisions between traditionally defined units such as the north-west or south-east LBK. Read together, these papers draw into sharp relief that we still need to find adequate ways of interpreting the differences in the sharpness of boundaries between LBK regions. Ivo van Wijk's chapter adds to this debate by pointing out the choices and rationales that went into settling specific areas of a landscape, in his case southern Limburg, while leaving other areas blank—a dynamic that underwent some significant chronological changes. Finally, Luc Amkreutz is also concerned with how networks at a regional scale changed over time. His particular focus is the evident contraction in the extent of networks in the German and Dutch Rhineland towards the end of the LBK, which he links to contrasting trajectories of colonization several generations earlier.

The papers in these sections all tackle the problem of how best to interpret the kinds of variability and diversity they encounter in the material under study and the tension between diversity and uniformity. Their approaches have remained as eclectic as the foundations laid by Modderman. We see this very much as a strength and a necessary step to inform our ideas on what LBK diversity is and how we can interpret it. Nevertheless, more reflection on the current usage of key terms is necessary. Also, we do not believe that a focus on diversity on its own should be the last word. We will return to both these issues later in this paper.

In order to further widen the possible range of approaches currently being attempted for the LBK, we have also included contributions on other large-scale cultural entities where similar issues are being discussed. Their insights form the final section of the book and provide a wealth of inspiration for new approaches that have barely been tried out in an LBK context. We also hope that these analogies will help us to trace recurrent structural similarities between different case studies. Marc Vander Linden provides a blow-by-blow comparison of pottery, burial customs, architecture, subsistence, and migration processes between the LBK and the Final Neolithic Beaker phenomenon and concludes that close attention to the specific constellation of these features is more productive than the simple comparison of stylistic choices at different scales. In her paper on the Near Eastern Halaf phenomenon, Alexandra Fletcher traces how the interpretative weight of diversity and uniformity has shifted over the course of research history and provides a framework for how these competing pulls can be reconciled by focusing on shared social goals as they are performed anew across a wide network. For Robin Beck, the North American Mississippian complex is a "set of transformations based on the intersection of mounds and maize" (p. 445), a basic set of material culture that could be—and was—adapted to changing social strategies. In his paper on the Austronesian Lapita culture, Matthew Spriggs focuses on the modalities of the long-distance spread of people, objects, and languages and on the implications this has for how diversity can emerge. A final chapter by John Barrett then explores the usefulness of a broadly evolutionary way of thinking for providing a framework with which we can transcend a view of the LBK as a specific material culture trace, appreciating instead its generative powers in enabling certain ways of life.

While the grouping of these papers into different sections largely reflects conventional analytical categories, there are several recurrent themes cross-cutting them, and these deserve to be briefly drawn out before returning to some final reflections regarding the role of diversity in our explanatory models for the LBK in particular, and for archaeological cultures more generally.

Connecting themes

Uniformity, diversity, and crisis

Several of the papers directly address the tension between uniformity and diversity. In this, they largely seem to follow Barbara Van Doosselaere and colleagues' definition of diversity as "material heterogeneity more or less explicitly assumed to be the expression of social and/or cultural plurality" (p. 160). This means that diversity will generally develop under certain sorts of circumstances. For example, the use of lithic raw material sources in both Poland and the Graetheide diversifies over time, a process apparently not primarily driven by straightforward economic dependencies between "producers" and "consumers". Rather, diversification towards the end of the LBK, at least in the Dutch case, could be the result of a disruption in traditional mechanisms of social cohesion, resulting in new ways of creating and expressing identity. Similarly, Amkreutz maintains that collapsing long-distance networks in the Rhineland led to more decisions being taken at a smaller social scale, and therefore to more heterogeneity in all aspects of life. Zeeb-Lanz and Haack also argue that the unprecedented ritual innovations documented at Herxheim are an extreme response to a kind of crisis in cultural values at the end of the LBK. Innovation in ritual was necessary to articulate a new value system which could transcend this impasse.

These papers make the important point that the transformations in the Late LBK network, the presumed "crisis" at the end of the LBK, cannot solely be explained by tracing possible environmental or demographic factors, but also largely depends on the specific trajectories a given set of sites was involved in, and hence on social relationships and worldviews. These, too, could reach a tipping point, but how they intersect with the classic prime movers of environment and demography, which have so far dominated the discussion at least in western areas (e.g. Gronenborn 2007; Schade 2004, 222–237, but see Gronenborn *et al*. 2014; Stäuble 2014), is still far from clear. Both internal dynamics and possible outside factors need to be combined in more complex, multi-causal models, which can then form a sounder basis for comparison between LBK regions. This will be one crucial task over the next few years of research.

Yet is diversity really a response to crisis—in other words, do LBK people only change their ways when they really have to? And, as the other side of the coin, can material culture uniformity therefore be equated with social cohesion, and is this the default position? It increasingly seems that all these questions must be answered in the negative. At least since the seminal article by Sommer (2001), the dangers of equating uniformity simply with flawless, but unthinking repetitions have become clear. In Sommer's argument, uniformity is the hard-won result of control by elders, and while one may quibble with the details, it is evident that some kind of social effort was invested in the perpetuation of similar material culture. This situation can thus not be taken for granted; instead, cultures are generally constantly changing (as argued in this volume by Vander Linden, amongst others). In this sense, uniformity deserves at least as much attention as diversity, and can no longer be seen as the pre-interesting backdrop to some later expression of "agency".

Therefore, we should start to think about how alignment with, or divergence from, previously performed ways of doing things were embedded in social trajectories in the past, and indeed these ideas are beginning to emerge alongside the older paradigm. For instance, Hauzeur still references a "LBK root tradition" from which her material then deviates—yet it remains very hazy what this root tradition consists of or where it is to be found (other than somewhere "further east"). Much more productive is her realization that the Luxembourg sites are not randomly aligned to the wider networks around them. Rather, items she interprets as reflecting largely economic interactions (such as exchange in lithics) are more closely aligned with areas further to the north-west, while areas to the south-east are referenced in the constructional details of houses, arrowhead lateralization and specific pottery motifs—aspects Hauzeur connects to explicit statements of identity affiliation.

Whether or not this division will be confirmed as more data come to light, it shows that LBK networks were not simply least-cost affairs, but were also channels through which individuals and communities positioned themselves in relation to others, for instance in order to avoid conflict. It is often suggested that the initial LBK expansion would have provided a very different set of circumstances than following periods (e.g. Fiedel and Anthony 2003; Frirdich 2005; Petrasch 2010), and as Amkreutz shows, these initial historical trajectories can exert a long-term influence on later developments. The question is thus not whether a given LBK region was particularly uniform or diverse (from what?) at any one point, but at which levels different connections and alignments with others were selectively created, crossed over, or rejected.

Identity, change, and intentionality

This aspect is referenced in most of the contributions, but unsurprisingly, authors have chosen to address it at very different spatial and chronological scales. For example, in her review of LBK diet and mobility, Bickle demonstrates that alongside patterns at a LBK-wide scale, for instance a tendency towards patrilocality, there is considerable diversity in how even "core" cultural aspects, such as gender relations, were being played out. As such, there was no one way in which LBK communities negotiated different aspects of identity. When discussing large-scale and culture-wide models, we should not neglect the very real differences in the experience of individual lifeways that were still possible within these broad frameworks.

A key part of defining one's identity involves the creation of boundaries between self and other. This is argued by Zeeb-Lanz and Haack, who see Herxheim as an elaborate and rather bloody way of creating a reviled "otherness" at the end of a cultural phenomenon. In contrast, for Pechtl, boundaries were deliberately maintained over several centuries, even at a regional scale. In his Lower Bavarian case study, artefacts pertaining to all areas of social life—for instance at the level of aesthetic preferences (pottery), ritual customs (frequency of pit ovens and of house orientations), or social integration (size of sites)—consistently differ between regions. He suggests that this can best be interpreted as the material signature of ethnic groups, i.e. social formations at a level between individual sites and the whole culture. His argument is likely to gain currency as the implications of the genetic evidence are worked out further, and indeed similar situations have already been identified in Alsace (e.g. Bickle *et al*. 2013, 297–302; Lefranc 2007) and Hessen (Kerig 2010). These sorts of mapping exercises could in future be expanded to check which objects tend to be more consistently implicated, but most particularly to work out in how far the identification of strict boundaries (as opposed to blurred transitions) is simply a matter of scale or reflects real differences in the emphasis LBK communities placed on this level of social action.

The flipside of the deliberate maintenance of boundaries is their deliberate negation. It is here that Van Doosselaere and colleagues make a crucial contribution. They outline how the superficial stylistic unity of the VSG ceramic grouping is cross-cut by a series of possible technological solutions, with both LBK and non-LBK roots. One possible explanation is the deliberate creation of stylistic uniformity, regardless of which pottery traditions makers came from. This fashioning of new collective modes of material expression can also be recognized in the emergence of other Middle Neolithic phenomena, such as the new pottery and architectural canons of the Stichbandkeramik (e.g. Link 2012). These suppress differences at one level while creating boundaries at another in an emergent process. By changing the way it articulates with other nodes, the same item or practice may hence play very different roles in the Neolithic network.

This is also suggested by the contributions of Hofmann and Van Wijk. In the former, the changing role of hunter-gatherer produced pottery is traced in relation to the transformations undergone by LBK pottery production and use. These are two complex trajectories intertwining with each other, so that the outcome of this interaction changes depending on the much wider entanglements of a set of practices from production to use and discard. Similarly, Van Wijk suggests that the role of empty areas between LBK settlements changes from a buffer zone, which was perhaps positively valued as long as distance was a measure of status and colonization success, to a deliberate boundary area. This trajectory is intimately bound up with increasing settlement density and the resulting attempts to find alternatives for upholding social boundaries.

If we really take to heart the idea that a given artefact or practice does not have a single, unchangeable essence, but unfolds in resonance to its surroundings, albeit in trajectories partly shaped by its former history (e.g. De Landa 1999; Gosden 2005; Harris and Robb 2013; Ingold 2011, 76–88, 156–164), then the issue of analytical scale moves centre-stage, as these processes are by nature multi-scalar. To expand the example given by Robb and Pauketat (2013, 24), making a particular pot may be a short-term activity taking place at one particular location, but the traditions of workmanship instantiated in its production may be much longer-lasting, and the sources of different components (clay, temper, decorative motifs, vessel shape) may be distributed quite widely across space as well. The activity draws not just on the exigencies of the present moment, but also on past trajectories, and not simply on the current location, but on wider networks and associations. It is in the intersection of these various strands that the dynamic properties of all actions lie.

Scale and dynamic practices

The two contributions on houses and settlement sites close in on these issues. Both papers stress that some aspects of buildings are more durable and others more malleable. These can be linked back to either Mesolithic traditions (as argued for the more variable aspects by Beneš and colleagues) or to the Near Eastern origins of the Neolithic way of life (as argued for the more persistent traditions in both chapters). Thus, a house is not only responding to the exigencies and requirements of its inhabitants over the course of one or more generations, but also has a developmental trajectory of several millennia. The specific shape, building material, or social unit inhabiting the house are less important in these arguments than general principles of settlement-wide spatial organization and social coherence. This conclusion will no doubt be debated, but forces our attention outwards to the scales of deep time and large space which we have tended to neglect in recent decades (see also Robb and Pauketat 2013; McGlade and Van der Leeuw 1997). This means that the LBK cannot be understood with reference to its own internal dynamics alone, but is itself the product of further transformations and of creative realignments of materials, people, animals, and objects.

Following this broadly relational view, in his comparison of the LBK and Bell Beaker phenomena Vander Linden concludes that a simple comparison of how diverse artefacts, taken by themselves, are in time and space is relatively unrewarding. This kind of patterning is very much an issue merely of analytical scale, whereby similarities from one point of view can be further differentiated as one focuses in on the detail. It is more promising to compare how artefacts are bound together in sets of practices—something Pauketat (2013) would refer to as a bundle. Indeed, this is also the approach taken by the other contributors in this section. By looking at aspects such as the existence or not of a clear origin point, modalities of spread, and aspects of social organization, Vander Linden suggests that in spite of sharing the same tension between uniformity and diversity, the LBK is a more coherently structured set of material culture bundles than the Bell Beaker package. This insight could be drawn upon to explain the LBK’s greater spatial and chronological extent.

This poses the question of what may have held an entity recognizable as "LBK" together, rather than simply what may have rendered it internally diverse. For the process of Earliest LBK migration, material culture uniformity has been seen as key to maintaining very extensive, but thinly populated networks (e.g. Frirdich 2005; Petrasch 2010). This narrative is, to quote Spriggs, "almost uncanny" (p. 475) in its resemblance to the spread of the geographically and chronologically far removed Lapita phenomenon. Here, colonization is primarily seen as a kind of safety valve for younger sons who would not be able to achieve renown at home in a strictly hierarchical system, a proposition also often voiced for the LBK (most recently by Van de Velde forthcoming). Yet at least for the LBK, we still have some way to go in defining at what level "competition" would in fact have been played out, or what the opportunities for internal hierarchy were. It will be interesting to critically trace the differences, as well as similarities, with the Lapita case and the impact these had on the later trajectories of these entities. Once again, Spriggs reminds us that the best way to go about this is to shift our focus from artefact similarities pure and simple to the kinds of practices in which these items were combined.

The role of competition in driving social change is also addressed by several other contributors. For the LBK, Dębiec describes the extensive sequence of deposits at Nezvisko, of which human bone forms one component. This challenges analytical categories such as "structured deposit" versus "burial", but, at least in Dębiec's reading, also articulates wider differences in LBK worldview, for example between plant and animal foods. These wider concerns are drawn together at a specific location for a specific act which is different from most others ("diverse"), yet within the logic of the LBK. The main motivation behind this episode of display and consumption may have been a potlatch-style event in which the mourners competed for status and renown.

While productive in the way in which it represents individual events as multi-scalar, we must be careful not to import only half an analogy. In archaeology, an analytical focus on "competition" often seems to imply a focus on the activities of self-interested adult males, reducing everyone else to a silent majority (Fowler 2013, 87–95; Robb and Pauketat 2013, 21). Fletcher's discussion of feasting during the Halaf period is far more nuanced and serves as a counter-model here. She traces how material culture is manipulated to foster certain social ends and sees feasting primarily as a way to publicly deny increasing social divisions, a kind of "appeasement" of the remainder of the community. Similarly, Beck's study of the Mississippian traces how communities like Cahokia and

Moundville became attractive centres for settlement because they promised a new experience of social cohesion. Yet with more settlers came more inequality, eventually resulting in decline as people rejected hierarchization and moved on. Both studies provide a fruitful starting point for investigating which kinds of mechanisms may have held LBK sites together, perhaps particularly the larger or long-lasting ones. From a comparative perspective, it will also be interesting to ask why in the Near East this tension was eventually overcome on the side of aggregation, resulting in more permanent urban centres and institutionalized inequalities, while for both the Mississippian and the LBK this step change was never achieved. It is studies like these which can help us formulate the new conceptual frameworks which, following Barrett, are an indispensable first step in moving from an increasingly detailed description of diversity to an actual modelling of the LBK as a complex integrated whole, a "self-organising system" (p. 513) with many different components.

In sum, these case studies from far afield are an invitation to move LBK research one step further. Over the years, there has been a shift in focus from mapping and comparing cultural traits to thinking more in terms of practices and their repercussions and to start to experiment with new models of causation. Yet we can still do more to appreciate the complex interplay of ecological and social circumstances and the many ways in which they are intertwined, perhaps by working more explicitly with different kinds of relational approaches (recently summarized and discussed in Fowler 2013, 20–67), by focussing on transmission processes, as evolutionary archaeologists stress (e.g. Bentley *et al.* 2011), or by seeking more formal and structured comparisons with situations beyond the LBK. In what follows, however, we want to return to the LBK case study and briefly explore a few ways in which the LBK as an entity may be worth reflecting on.

Implications

If we begin to see sets of material culture as flexible and situationally dependent constellations, formed around attractive core propositions, the next task is to reflect on what those core propositions might be. For the Mississippian, this is mounds and maize, for the Halaf painted pottery and large-scale feasts, for the Lapita language and elaborate ritual. These constellations have a certain coherence based in recurrent sets of material culture and practices (Barrett's "niches" enabling certain forms of action), but because they channel and are involved with a wide range of contexts, they also have the potential to be re-cast into new sets of relations, or involved in new sets of projects. In the words of Lemonnier (2012, 133), they are resonators: bundles of concerns linking a variety of social fields in a non-verbal, but emotionally very salient way. Lemonnier's expectation is that such resonators would be relatively long-lasting in their basic features—a kind of "core tradition" (e.g. O'Brien 2011)—but that they would instead be constantly tinkered with and realigned, until a tipping point is reached.

Comparable core constellations certainly existed for the LBK (e.g. Whittle 2003, 139–143). One important constellation seems to be between longhouses and land, as also pointed out by Barrett (this volume). Given the results of isotopic studies, in which locally born males were more likely to be associated with stone adzes (most recently Hedges *et al*. 2013), and arguments for long-term continuity in the use of certain agricultural plots by specific house groups (as argued for Vaihingen by Bogaard *et al*. 2011), a strong link is indeed emerging between houses, land, and axes in a patrilocal system. This could be a powerful cluster through which other aspects of LBK identity were refracted and it could provide a basic model of relating that could be adapted to suit the needs both of the initial spread of the LBK and of later developments. Such a system would perhaps also be particularly amenable to the kind of competition that resulted in violent outbreaks at various sites across the LBK distribution. As a counter-position, one could also stress the connection between households, pottery, and hospitality as a basic constellation through which much of daily life was played out and social cohesion built up. This involves seeing the house as a place where people of diverse origins (whether this includes foragers or not is irrelevant to this argument) could forge a common identity through shared routines and commensality (Whittle 2003, 142–143). The evident effort that went into producing and decorating pottery could find its justification in the importance accorded to such bonds in community creation.

At this stage, these are merely suggestions, and the way they mesh with each other and across traditional specialization boundaries (artefact studies, archaeozoology, settlement archaeology, and so on) means that much integration work will be necessary in the future. Yet one strong tendency that already emerges is that to trace these connections fully, we will have to adopt a multi-scalar approach. Diversity in this view does not originate at any particular, pin-downable scale, but in the articulation of several trajectories which operate at different levels, both spatial and chronological (Fig. 1.1). This kind of distributed notion of diversity means that there is no "right" analytical scale at which we should try and seek a putative origin of diversity. Instead, scale of analysis is a pragmatic choice (and to an extent always political) in which we temporarily black-box some sections of our web of relations in order to identify the workings of another section in more detail (e.g. Harris and Robb 2013). This is unavoidable, but is a process we need to make more consistently explicit.

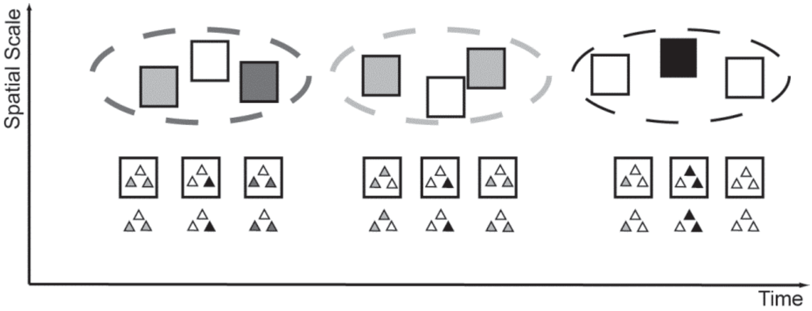

Fig. 1.1 Schematic representation of the relation between analytical scale and perception of diversity.

This discussion on scales has several consequences, two of which we would like to draw attention to here. On the one hand, the level of the archaeological culture remains a rewarding scale of analysis (see also Roberts and Vander Linden 2011). Of course, its boundaries will be artificial, and a lot of internal diversity will be de-emphasized, but this is the case whether we look at cultures, regions, sites, or even individual bodies and artefacts. The question is rather whether this scale will be productive in revealing emergent patterns over the longer term and across wider geographical reaches, something we have tended to marginalize. For example, while crisis scenarios based on a catastrophic collapse of cultural values and/or economic relations at the end of the LBK have been argued for western areas, they seem less applicable to eastern areas (Stäuble 2014). Rather than being satisfied with this difference, we could now also ask why other transformations at this time—for instance in the size of houses, their more open internal layouts, or in the choice of personal ornaments, for example—were similar across these divides, and how this could articulate with our suggested core constellations.

Secondly, and more in line with the theme of the book, the way we investigate diversity can also move forward. So far, the identification of "diversity" has essentially proceeded from a confrontation of analytical scales which were only partly commensurate. For example, we often start from a pattern identified at a regional scale, and then argue that our site does not fit it exactly. This is what has created our pervasive definition of diversity as “difference from” an ill-specified other, eternally located elsewhere. However, these two scales cannot be opposed in that way. They are constitutive of each other, but they are embedded in analytical frames of different sizes, and neither of them is static.

This may well be an issue of developing a more suitable terminology for differentiating between kinds of diversity. For example, there could be a case for distinguishing a consciously sought distinction from others (diversity) from the simple undirected ability to differ (which one could perhaps term variability). The corresponding terms for a lack of differentiation could contrast a willed uniformity and an accidental sameness. To name one example, the clay sources exploited—if access was not explicitly defined through group membership of some kind—may be merely varied, while pottery decoration—which explicitly aimed to create a household identity, for example—would be diverse. As this is a situationally dependent definition, whether a given item is diverse or merely varied across groups could change over time, even within the LBK. In this case, the terminological distinction would first and foremost aim to render explicit which processes we actually believe are behind the observed difference, and which are rarely tackled head on. An alternative suggestion may be to distinguish our own analytical steps by differentiating dissimilarity at the level of material culture patterning (i.e. what most authors in the present volume mean by diversity) from the social consequences and emergent properties we as archaeologists attempt to deduce from this (and which one could render as variability, inconstancy, instability and so on). Finally, one could add a temporal dimension: while material culture variability may be reversible as long as it is not loaded with additional meaning, if it is not suppressed it becomes irreversibly differentiated[1]. This for instance happened at the transition between the LBK and its Middle Neolithic successor cultures, an event which an evolutionary analogy would describe as “speciation”, while appreciating that the boundary between such “species” remains fuzzy (e.g. Grosz 2004, 21). At this stage, we do not want to advocate any particular solution as necessarily superior, but we do hope that these reflections may help to further direct and sharpen the debate.

In sum, both diversity and uniformity for us are emergent properties, the situated realization of the potentials for existence in the past, and of the conceptual frameworks we create in the present. As such, they will stand out, fade from view, or recongeal depending on which strands we currently juxtapose. The resulting patterns can be described as “diversity in uniformity” (Modderman 1988), as “inconsistent commonality” (Whittle and Bickle 2013, 385), as “common difference” (Bickle, this volume) or as “the same but different” (Fletcher, this volume). What is important is that we can no longer simply be content to point at the existence of “diversity”, as if this were a single phenomenon, and seek a single cause (such as hunter-gatherer involvement), regardless of the level at which this diversity occurs, what it concerns, and when and how it emerges or disappears. Nor can we uncritically accept “uniformity” as a default condition requiring no further explanation. Instead, it is time we improved our models of how both diversity and uniformity blended to form variously embedded, vibrant, complex social systems, something which can only benefit from more sustained and systematic comparisons with similar situations elsewhere. The papers in this volume, we hope, are a first step in this direction.

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Notes

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[1] We are particularly indebted to Pieter van de Velde for this suggestion.

ARCHITECTURE AND DAILY LIFE

CHAPTER TWO

HOUSE AND HOUSEHOLD IN THE LBK

LECH CZERNIAK

Introduction[1]

Longhouses of the LBK, due to their monumentality and easily recognizable formal characteristics, belong to the emblems of this culture. At the same time, one can see a diversity of houses with regard to their size, construction, form, and spatial layout. There is no doubt that some of these differences result from changes over time and regional distinctiveness. They may have been caused by both changes of meanings, resulting from borrowings or own invention, as well as by non-discursive processes of divergence, which accompany a steady reconstruction of the network of intergroup contacts ("interactions sphere") in the vast territory populated by LBK communities. However, this diversity is also noticeable among houses which occur at the same time and within one or a few neighbouring villages. An interpretation of these phenomena must refer to more direct questions. What were the ways of inhabiting these houses? What was the functional and spatial organization of houses? How many inhabitants did a house have and what kind of ties linked them? When, by whom, and for whom was a new house built? How long was a house inhabited, how was it inherited, and in what circumstances was it abandoned?

Anthropology provides many examples of heterogeneity of ways of inhabiting longhouses, their internal divisions, the function of rooms, the number of inhabitants, and the social relations which linked them (e.g. Bloch 1995; 2010; Gillespie 2000; O'Gorman 2010; Waterson 2013). It is therefore surprising that for more than 30 years most LBK researchers have been convinced that the longhouse functioned for about 25 years on average and was inhabited by about six to seven persons, who formed both a nuclear family and an independent household. This is a relatively short period for a very solid and even monumental structure (e.g. Rück 2009; Schmidt *et al.* 2005). Furthermore, a low number of household inhabitants also contrasts with the enormous labour expenditure which was necessary for gathering materials and constructing the house (e.g. Startin 1978). Therefore, it is necessary to ask how solid the foundations of this knowledge are.

In my opinion, the persistence of this—one can perhaps say "canonical"—interpretation of the LBK's longhouses results from the authority of three "founding" concepts: (1) *Hofplatzmodell*, (2) "modular" (tripartite) construction, and (3) "local" origin.

In the present paper I will deal with the above problems using the example of houses and buildings in LBK villages situated in the vicinity of Kraków (Fig. 2.1). Until recently, the site in Olszanica was the best-known from this area (Milisauskas 1972; 1986). In the years 2003–2007 the Kraków Motorway Archaeology Unit excavated a series of new LBK sites in a broad territory within the framework of rescue excavations.

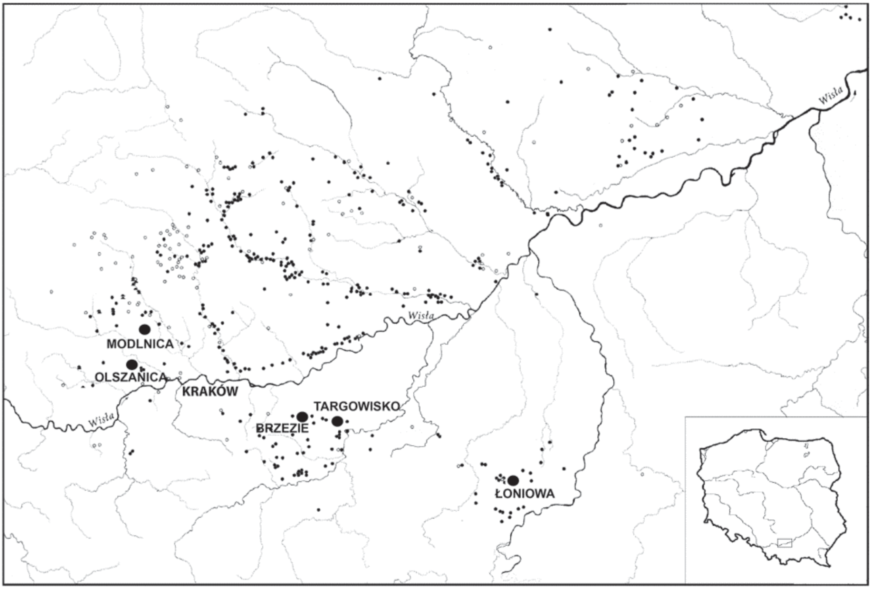

Fig. 2.1 Distribution of LBK sites in the upper Vistula basin. Larger black dots mark the location of LBK sites mentioned in the text (after Czekaj-Zastawny 2008, fig. 53, with author's modifications).

House, household and village in the LBK

Longhouses within LBK villages form clusters which are almost universally interpreted using the “yard model” (*Hofplatzmodell*: Boelicke *et al*. 1988; Farruggia *et al*. 1973; Lüning 1997; 2005; for a summary of recent discussion, see Zimmermann 2012). In recent years a critical reappraisal of the *Hofplatzmodell* has been undertaken, chiefly by Oliver Rück (*Zeilensiedlungsmodell* = “row model”, further explained below—Rück 2009; 2012; for a discussion see Czerniak 2013; Lenneis 2012; Link 2012; Petrasch 2012). The main focus of this discussion is a problem of the interpretation of the relationship between buildings.

However, the “yard model” is a much broader concept. Namely, it assumes that a household was a nuclear family (parents and children) living in a single house. Furthermore, it proposes that each household was rather an independent farm (a farmstead) than part of a village community. It also assumes that the house was used for about 20–30 years, which has significant consequences for the interpretation of dynamics of changes in the built environment (including demographic estimates, system of inheritance, social involvement in house construction, etc.). Therefore, further discussion requires a distinction between at least two aspects: the social organization and the spatial arrangement of houses.

Social organization of the LBK: Household—clustered neighbourhood—village community

In analyses concerning the LBK, the terms of “house” and “household” are considered almost synonymous. A basic tenet of the “yard model” is the assumption that only one house in the entire cluster forming a *Hofplatz* (or “yard”) was used at a given time. However, it is underlined in theoretical discussions that it is difficult to define and especially to recognize the boundaries of a household (Kuijt *et al*. 2011; Souvatzi 2008; Tringham 2000). Especially Stella Souvatzi (2008) argues that a group forming a household may have inhabited more than one house. In my opinion, a further discussion on the social organization of the LBK should take such a possibility into consideration.

One possible example are two pairs of houses, numbers 8 and 9 and numbers 10 and 11, from the site of Targowisko 12-13 (Fig. 2.2). The first two are connected with fences (Fig. 2.3; for a detailed description see Czerniak 2013). Therefore, they very likely form a synchronous and functionally associated arrangement, which can be interpreted as a household consisting of two houses. Traces of rebuilding of these houses are also evident.

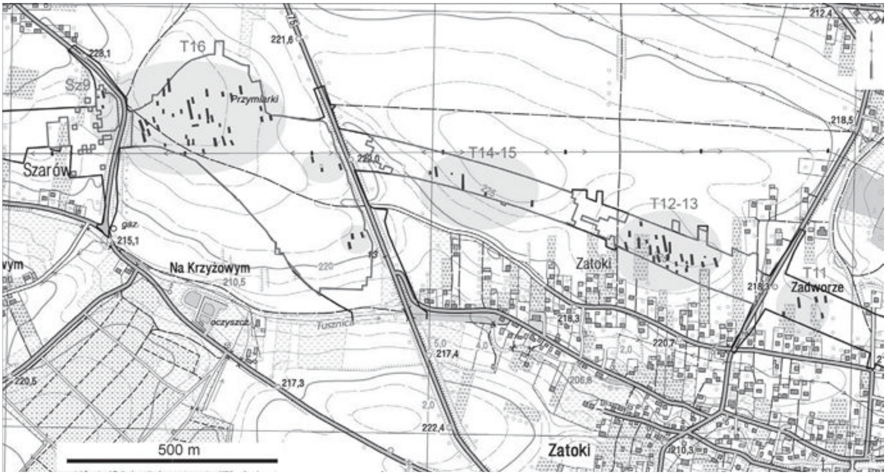

Fig. 2.2 Location of the LBK settlements at Targowisko, comm. Kłaj. Abbreviations: Sz9 – Szarów, site 9 (part of T16); T16 – Targowisko, site 16; T14-15 – Targowisko, site 14-15; T12-13 – Targowisko, site 12-13; T11 – Targowisko, site 10-11 (after Czerniak 2013, fig. 2).

A more detailed analysis of the arrangement of postholes in the northern part allows to suppose that house 8 was originally constructed as a somewhat smaller building (darker outline in Fig. 2.3) and it was only later that the northern part was added (lighter shade in Fig. 2.3). This is suggested by the alignment of posts forming the eastern wall, which does not ideally match the line of the walls of the main structure. Another indication might be the very close proximity (with a small shift sideways) of the northernmost transverse row of the central part of the house and the southernmost row of the suggested extension, which could indicate a sturdy wall at this point. On the other hand, there is no doubt that the northern extension was functionally part of house 8. This is evidenced by the lateral (borrow) pits which precisely continue the line of pits of the main building, and by the layout of fences which connect the extension with the remaining built features. In its original state, house 8 was 17.2 m long, and 23.5 m with the addition of its extension.

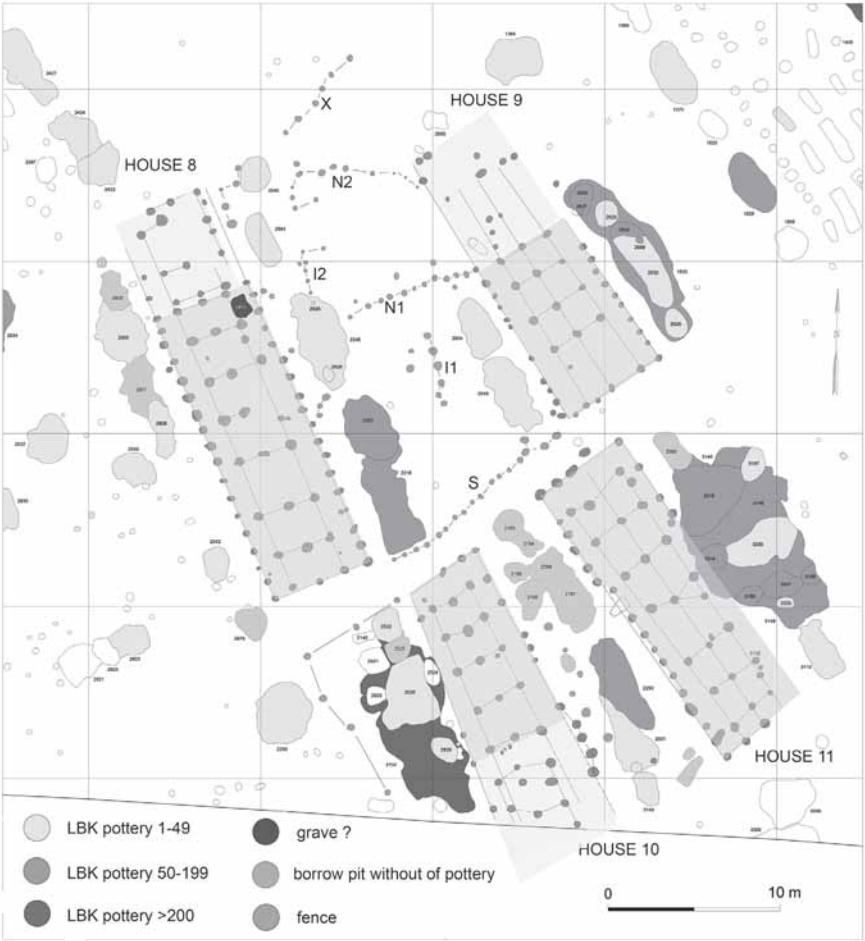

Fig. 2.3 Targowisko, site 12-13. Plans of houses 8–11 (after Czerniak 2013).

It seems that, analogously to house 8, house 9 was originally constructed as a shorter building (9.8 m long; darker outline in Fig. 2.3). This is suggested by the arrangement of postholes. However, a later addition of an extension at the northern end of the house (bringing the house's length to 17.3 m) is less evident here, as discernible postholes are distributed in a random pattern. The possibility that the house was extended at a later time is suggested by two observations. Firstly, the lateral pit on the east side of the house was extended beyond the original length of the building. Secondly, this is implied by the northern fence (Fig. 2.3, fence N2), which seems to connect the extended northern end walls of houses 8 and 9. These fences remove any doubts about whether these two houses may in fact have existed simultaneously.

The location of an additional pair of houses (10 and 11), which is evidently spatially related to houses 8 and 9, renders this problem even more complex. In my opinion it is legitimate to suppose that house pairs 8/9 and 10/11 were constructed in such a manner as to ensure that houses 10 and 11 did not block the entrances located in the southern end walls of houses 8 and 9. It is not known whether all these houses were built simultaneously, or whether houses 8 and 9 were rather constructed first, and were somewhat later followed by houses 10 and 11. This is because the latter give the impression of having been fitted into an already existing layout, as suggested for example by the small distance between houses 10 and 11. In terms of pottery analysis, all four buildings could be contemporary, but dating by pottery phases is not precise enough to prove this (see endnote 3). Taking a broader look, the mentioned houses are part of a larger and more complex cluster of contemporaneous houses, a social unit which is perhaps larger than a household.

An especially significant feature of the relative layout of houses 8 and 9 are clearly discernible fences. The southern fence (S) encloses the space between houses 8 and 9 from the south and at the same time it accentuates the fact that the end walls of both houses were built in line with one another. Fence N1 encloses the space between the main parts of both buildings from the north. This fence extends from the northern wall of house 9. It stretches westwards up to the lateral pit alongside house 8. There, one can see traces of the connection of this fence to fence I2 near the northern edge of this pit. This fence may also have extended further south, which is suggested by further traces of posts between the southern edge of this pit and the wall of house 8. Fences N1 and S mark an enclosed space which was shared by both houses. Its existence may indicate not only that the houses were contemporaneous, but first of all that inhabitants of both houses may have carried out certain activities, for instance agriculture or stock breeding, communally.

Another fence was situated to the north of the described space. Fence N2 connected the northern walls of both houses. This could be an additional demarcated space with a different function, due to the fact that fence I2 clearly continues the line of fence N1 and connects it with fence N2, thus forming another enclosed space.

To sum up, there is no doubt that houses 8 and 9 formed a configuration of interdependencies which does not fit into the *Hofplatzmodell* in terms of social and economic organization. The question is how exceptional this configuration was. At the examined site there are no other arrangements of contemporaneous houses which would form similar layouts. However, at nearby Targowisko 16 there are pairs or groups of three houses which are contemporaneous and were configured similarly to houses 8 and 9. They may have formed the basis of an identical social and economic organization. The absence of fences seems to be of secondary importance in this case.

What, then, were such configurations of houses? What links existed between inhabitants of each pair of houses (8/9 and 10/11) and what were the links between both pairs? In my opinion, each of the discussed pairs of houses formed a unit of social organization which can be defined as household[2]. It cannot be excluded, however, that all four houses discussed here formed a single household (extended household as defined by Kuijt *et al.* 2011). The idea of "house societies" seems to be of special interest in this case, but cannot be developed here for lack of space (but see Bickle and Whittle 2013; Borić 2008; Hodder 2013; Whittle and Bickle 2013).

In general terms, a search for different patterns of house location within the space of a village seems to be a good starting point for a social interpretation of the built environment of LBK villages. The *Hofplatzmodell* was the first attempt in this regard and it concerned a particular case of house arrangement. However, it is interpreted as a universal pattern (Zimmermann 2012). Probably not only in Lesser Poland longhouses form at least three different kinds of clusters.

The first kind are clusters corresponding to one household, which can be defined as a group inhabiting one to four contemporaneous houses. An example is offered by the discussed houses 8–11. The second kind are clusters of houses which are contemporaneous but which are more loosely associated with one another than in the case of houses 8–11. This can be illustrated by adding houses 5 and 7 to houses 8–11 (Fig. 2.4). The former two houses are situated at some distance from the others, but they retain a defined spatial order, which is suggested by their similar orientation and alignment in rows. The location of house pair 8/9 refers to house 7 (the southern end walls of all three houses form one line). House 9 seems to be associated with the contemporaneous house 5, as the location of the latter gives the impression that it was built behind house 9. In total, the discussed cluster is formed by 6 houses, arranged in a regular three-row layout and falling into the same pottery phase[3].

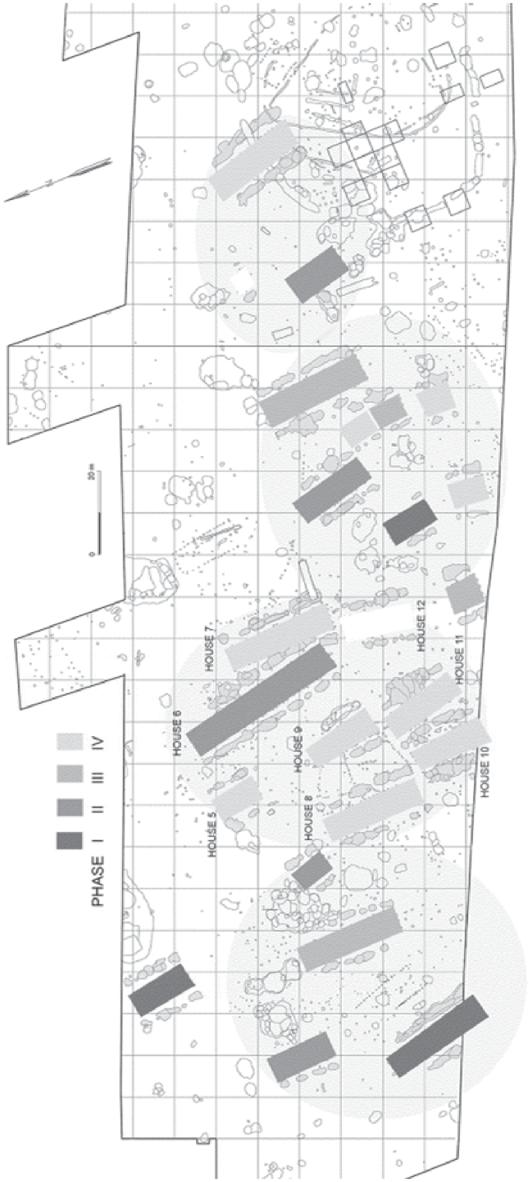

Fig. 2.4 Targowisko, site 12-13. General plan of village with division into "wards" and settlement phases.

The described cluster of houses may have corresponded to the existence of a social group formed by several households. Interestingly, the presence of houses 5 and 7 demonstrates a diversity of individual households. House 5 was small and more slightly built. On the other hand, house 7 was the largest and had the sturdiest structure within the group. I propose here the term “clustered neighbourhood” for this kind of group of two or more interrelated households, in reference to terminology used for the Anatolian Neolithic (see Özbaşaran 2000; also Bogaard *et al* 2011; Düring 2007; Düring and Marciniak 2006; Louwe Kooijmans *et al*. 2003; Marciniak 2013).

The third kind of house cluster can be defined in the simplest manner, as “being a cluster”. At Targowisko 12-13 it is possible to isolate at least four such clusters (Fig. 2.4). In my opinion their presence expresses a somewhat different aspect of the social order, which combines social organization and ownership of a place of building and its organization.

Yard—ward—row

The third kind of house cluster discussed above is in fact a variant of the clusters identified in the *Hofplatzmodell* concept. This kind of arrangement of houses within the village can be evidence of a socially established partition of the village space between separate groups. In my opinion it is possible to assign two distinct statuses to such clusters, depending on whether houses belonged to one household (“yard model”) or to more households (clustered neighbourhood—“ward model”)[4].

The “yard model” system concerns a situation where the village space is partitioned into house clusters belonging to one household (usually one or two houses), and further houses were subsequently built in the neighbourhood after the previous one had been abandoned. What I propose here is thus a modified version of the “yard model” which accepts the possibility that a group forming a household concurrently inhabited more than one house.

The “ward model” is a more complex variant of the “yard model”, as it concerns a house cluster within which there may be more than one household. Houses forming a ward may be contemporary or form a more complex sequence of two or more building phases. A distinction between the “yard” and the “ward” system may prove difficult without the proper dating of houses.

A system defined as the “row model” is significantly different from the above (Rück 2009; 2012). According to Oliver Rück, houses occurring in one row were generally contemporaneous. In my opinion O. Rück is right in his strong criticism of the “yard model”, but the “row model” (and its numerous variants) does not offer a complete description of the system of spatial organization of LBK villages (see Lenneis 2012; Link 2012; Petrasch 2012). Apart from that, this model requires a better justification, at least with regard to the dating of houses, which has significant consequences for the interpretation of how the rows formed (simultaneously or successively, and if successively, then according to what principle?). It also seems indispensable to interpret the row arrangement of buildings from the perspective of social organization.

In this context, the interpretations of contemporaneous villages of the Vinča culture, where the organization of buildings is very similar to the “row model”, are of particular interest. Boban Tripković (2010, 12) believes that within one row buildings were positioned in such a manner that successive buildings gradually extended the existing arrangement. On the other hand, Adam Crnobrnja’s examinations of the settlement in Stubline demonstrate “a relatively high degree of settlement organization, with an apparent arrangement of houses not only in rows, but also in groupings of so-called ‘blocks’ concentrated around the open spaces between them” (Crnobrnja 2011, 38).

In my opinion it is very probable that the “row model” in the LBK functioned in a way similar to that in the Vinča culture. This would mean that—analogously to the “ward model”—it may have expressed a two-level social organization: household and clustered neighbourhood. Overall, it seems that within the LBK there were two general systems of organization of village buildings, which can be called the “ward model” (including “yard model”) and the “row model” (see also Bickle and Whittle 2013, 9). No doubt these models had numerous variants, which should be a focus of further studies. It is difficult to say what is expressed by the differentiation into these two systems. It is certain that neither of these was an exclusive “invention” of LBK communities. The “ward model” is already known from Neolithic villages of the Near East, Anatolia, and the Balkans. Therefore, it may have been of earlier origin in the LBK and was perhaps more conservative. The “row model” is more orderly and seems to be associated with larger villages of higher status. On the other hand, it may also be an expression of a different identity (related to the impact of the Vinča culture?). There is no doubt that this problem requires more detailed research. What is of particular importance is the accurate dating of houses, as determining how long houses were used for, and which houses within a given village functioned simultaneously, is of vital significance for identifying the organization of buildings and the social organization which was expressed through it.

To sum up, the possible synchronic use of closely neighbouring houses, as well as observations concerning rebuilds and extensions of houses, are an important indication that we need new interpretations for the spatial organization of LBK sites. It is possible to draw even more significant implications (concerning a longer time of use of houses and the number of people in households) from the hypothesis that LBK longhouses derived from traditions of the Balkan Neolithic and were used in a very similar way.

Origin of longhouses in the LBK

The concept of the "local" origin of the LBK house implies that it was a completely original creation of the LBK communities. As stated by Eva Lenneis, "the LBK house had no predecessor outside the LBK territory, and thus it must have been an indigenous invention of people in central Europe" (Lenneis 2008, 176; also 1997).

This hypothesis has a long tradition and has been almost unrivalled in the last half-century. Hans Quitta (1960) was the first scholar to propose such an interpretation. He criticized a dominant model based on colonists coming from the Near East, Greece, and the Balkans. A considerable role in demonstrating the input of indigenous communities was also played by P.J.R. Modderman (1988), and especially by A. Whittle (1996; for the most recent discussion see Bickle and Whittle 2013, 5–6).

More recent research, especially concerning DNA, does not support such radical views. The result of this is an "integrationist model" which allows a significant role for Late Starčevo groups and also assumes the participation of indigenous foragers (e.g. Lukes and Zvelebil 2008; Zvelebil *et al.* 2010; also D. Hofmann 2015; Oross and Bánffy 2009). Current research even seems to demonstrate that processes of colonization in central Europe were dominated by farmer communities (e.g. Brandt *et al.* 2013; Haak *et al.* 2010; Szécsényi-Nagy *et al.* 2015). In any case, the present state of research enables us to have a more open view on the possibility of comparing LBK houses and houses in Anatolia and in the Balkans (cf. Borić 2008; Czerniak 2013; Hodder 2013; Marciniak 2013).

In my opinion, the discussion on the origin of LBK longhouses must not be limited to a search for other longhouses or houses with a particular post structure, but it must include a broader context of social organization (especially the household), ways of inhabitation of the longhouse, and the spatial organization of the village.

The last 15 years of research on the Neolithic in the area of the Marmara region have yielded discoveries which significantly change the image of Neolithic architecture, and with which LBK longhouses can be compared. Here I have in mind such sites as Ilıpınar (Roodenberg and Alpaslan-Roodenberg 2008; 2013), Aktopraklık (Karul and Avci 2011; 2013), and first and foremost Aşağı Pinar, which can be included into the context of the Karanovo culture (E. Özdoğan 2011; M. Özdoğan 2013). Furthermore, the most recent research on architecture and organization of buildings of the Vinča culture, which is contemporaneous with the LBK and derives from the same Starčevo culture tradition (e.g. Crnobrnja 2011; Tripković 2010; see also Okolište: R. Hofmann *et al.* 2006), provides observations which inspire a revision of views not only on the origin of the LBK house, but also on its reconstruction and the way it was inhabited.

However, it is not obvious how to use this data. How can we measure similarities and differences between houses in order to be able to interpret their common origin or distinctiveness? On the basis of changes in architecture and building arrangements of Neolithic villages in the territory of the Levant, Anatolia, and Greece it can be seen that forms of houses, their structures, construction materials, sizes, and internal organization display significant differentiation and changeability through time, sometimes within one region and "the same" population (e.g. Banning 2010; Cutting 2005; M. Özdoğan 2013; Souvatzi 2008).

In a majority of these cases, the architectural differentiation reflected the innovativeness of local communities. This innovativeness was oriented either towards adaptation to local climatic and raw material conditions, towards social changes and expression of identities of separate household groups, or towards providing buildings with new functions. At a super-regional scale, phenomena of cultural divergence which result from breaking off old exchange networks and forming new ones may also have been of significance. The use of stone foundations or their absence, the use of wooden floors or clay floors, of mudbricks or wood and clay constructions for walls, of flat or gable roofs, and so on, are the most obvious examples of local diversity. More complex ones concern the presence or absence of graves, paintings, and installations of symbolic meaning in the interior of buildings. These changes render it difficult or even impossible to observe similarities and construct "genealogical schemes" for inter-regional borrowings. These examples cast doubt on research results which are solely based on typological analysis (e.g. Lenneis 1997). I believe that in this case it will be more interesting to search for structural patterns concerning social organization and spatial arrangement of buildings.

Moreover, the way we see the origin of the LBK is of considerable significance. For instance, the most compromising "integrationist model" may narrow the field of observation to the area of formation of the LBK, where indigenous hunter-gatherer communities lived. However, it may also admit that the idea of the house was brought by colonists who arrived from the Balkans.

In my opinion, the Neolithic architecture of Thrace and the Balkans is not merely a set of more or less distant analogies which are important only to inspire the imagination of LBK researchers. It is in fact the heritage of LBK communities, which was transformed in processes of inter-generational transmission and adaptation, but it could preserve previous social and symbolic contents. If we look at this heritage in a way which focuses on the social issues expressed in buildings, even the tell at Çatalhöyük does not look alien. The difference between Çatalhöyük and the average LBK village was significant from a formal point of view, as it concerned not only the structure of houses, but first of all the density of building arrangement and its spatial layout (Fig. 2.5 A). However, if we see this phenomenon in the framework of social organization, the spatial structure of LBK villages (especially in comparison with building arrangement in the "ward model") seems to be similar to that at Çatalhöyük. This is because the most significant difference concerns the spatial arrangement of houses forming a household. It can be assumed that in both cases a household was formed by groups of a few houses inhabited by nuclear families. However, at Çatalhöyük there was a "honeycomb" structure—clusters of a dozen or so houses connected so tightly that access to them was possible only through the roof. In the LBK, the basic structure was the "longhouse"—which we can interpret as a cluster of a few "nuclear" houses, understood as a row arrangement of several smaller houses ("segments") connected with a shared roof.

An essentially similar interpretation of the "longhouse" was already proposed by Bohumil Soudský (1969). However, it did not withstand the confrontation with the modular concept of the LBK house. As an aside, I will add that newer research at Çatalhöyük argues that a small house was part of a larger agglomeration of houses, which formed a household group (e.g. Hodder 2013). Is there any obstacle to assuming that the longhouse of the LBK was a structure which gathered two or more small single-family units under one roof, or indeed that a household may have been composed of more than one house? In my opinion it is an issue of a different reconstruction of the longhouse: for example adding a residential second storey and/or modifying the way of seeing the modular partition of the ground floor (see below). It is also a problem of a more open view on the mutability of building arrangements in Neolithic villages.

An example of profound changes in the organization of building arrangement may be offered by communities living at the turn of the seventh and sixth millennia cal BC in the region of the Sea of Marmara, especially at Ilıpınar (Roodenberg and Alpaslan-Roodenberg 2008; 2013). This tell functioned in the period of 6000–5400 cal BC and in the first three centuries its building arrangements resembled the spatial organization of the Çatalhöyük type. A radical change in spatial organization took place about 5700–5600 cal BC, beginning a new era which "shows a different approach to settlement construction. Starting in phase VI, the village demonstrates a totally different outlook in its aligned mud-brick houses, which were two-storeys high" (Roodenberg and Alpaslan-Roodenberg 2013, 70). At that time, a layout in the form of an arrangement into rows came into existence. Houses were small, roughly square, and interconnected. They were positioned so as to form a segment of a circle which probably surrounded a central open area (Fig. 2.5 B). It can be said that a gigantic "longhouse" came into existence in this way, and that it was in fact composed of numerous separate houses built one after the other. Fourteen

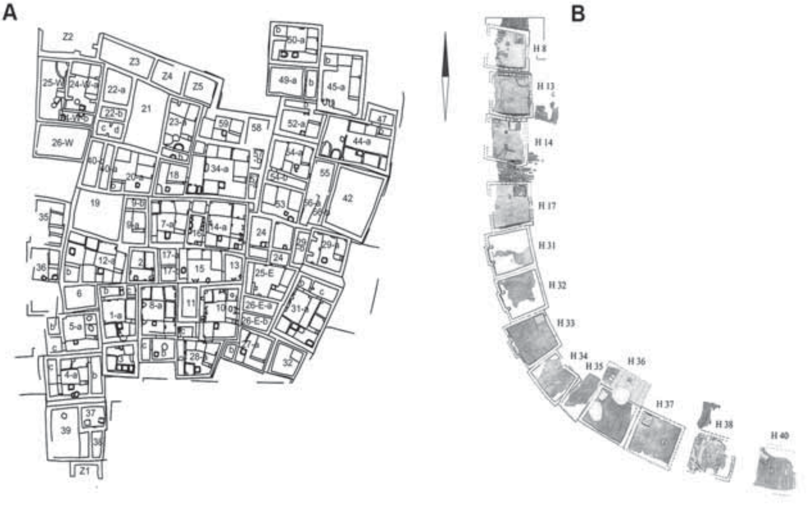

Fig. 2.5 Two different arrangements of house locations in Late Neolithic villages in Anatolia. A – plan of Çatalhöyük level VIB (c. 6400 cal BC) as excavated in the 1960s (after Mellaart 1964, fig. 2, with modifications after Düring and Marciniak 2006, fig. 5); B – plan of Ilıpınar VI (c. 5700 cal BC; after Roodenberg and Alpaslan-Roodenberg 2008, fig. 3).

of these houses were uncovered and examined. Each had separate masonry walls which were not shared with the neighbouring ones. Furthermore, the outlines of most houses were slightly moved sideways off the axis, which seems to be an intentional action supposed to stress the distinctiveness of each individual house.

The spread of a new spatial organization of villages, similar to the above example, can also be seen at the neighbouring site of Aktopraklık (Karul and Avci 2011; 2013), and also much further to the north-west at Aşağı Pinar, where the presence of Karanovo culture pottery was identified (E. Özdoğan 2011; M. Özdoğan 2013). Researchers agree that it influenced the Neolithic architecture of the entire Balkans, including the architecture of the Vinča culture (E. Özdoğan 2011; M. Özdoğan 2011, 427). In my opinion, changes in the Neolithic architecture of the Balkans, and especially of the Karanovo–Kremnikovči–Starčevo culture, and the appearance of architecture of the Vinča culture, form the context in which the appearance of LBK longhouses should be interpreted[5]. Houses of the Vinča culture (e.g. Crnobrnja 2011; Tripković 2010) should also be a point of departure for the interpretation of functionality and the way of inhabiting the LBK longhouse. Perhaps in this way we can also transcend the limitations resulting from the poor state of preservation of LBK houses, with their lack of floors and of traces how the house's interior was used. Furthermore, this also allows us to consider that the LBK house could have been used for much longer than hitherto believed[6]. The way of use was also much more complex, as it was associated with a multi-family and multi-generation group forming a household (e.g. Hodder 2013; Kuijt *et al*. 2011; Marciniak 2013). Using these alternative models, all historically linked (at a greater or lesser remove) to the LBK tradition, can provide new vantage points from which to approach the LBK house afresh.

What can the layout of structuring posts in the LBK longhouse tell us?

The idea of a "modular" structure of the longhouse is significant, as it demonstrated a recurrent pattern (Bickle and Whittle 2013; Coudart 1998; D. Hofmann 2013; Modderman 1970; 1988; Pavlů 2013). This concept of the house suggests a division of the longhouse into three parts (modules) and assigns a different function to each of them. The most significant consequence of this division is the interpretation of even the longest houses as inhabited by one nuclear family (only the central part of the house was used as residential quarters).

Another consequence is a very one-sided interpretation of the house's structure. Of particular significance is the opinion that the "SE module" was the only one above which there may have been a second storey, limited to a granary function. In my opinion it is very probable that all LBK houses had residential second storeys. The presence of a second storey is well-confirmed at this time in houses in Anatolia and in the Balkans, including the Vinča culture (Crnobrnja 2011; Roodenberg and Alpaslan-Roodenberg 2008; 2013). A residential second storey would drastically change the possible interpretations of the house's capacity (number of inhabitants) and functionality. In my opinion, that houses of the LBK in fact had a second storey does not need to be based on any particular traits of the houses themselves (in contrast to Lenneis 1997; Stäuble 2005, 191–198), which can be interpreted in other ways (see below), but on the fact that second storeys were present in houses of the Late Neolithic in Anatolia and the Balkans, and especially the Vinča culture. Two-storey houses from Ilıpınar or houses of the Vinča culture did not have a much more solid structure than houses in the LBK.

A hypothesis that LBK longhouses derive from the tradition of Neolithic Anatolian–Balkan buildings opens a field for discussion on opportunities for a more detailed reconstruction of internal partitions of the house, the function of rooms, and the size of the group inhabiting the house. However, these issues require another extensive paper. Here, I will instead focus on other general issues of the "house module" concept and show how the analysis of longhouses in western Lesser Poland can contribute to this discussion.

In this area, among the well-preserved plans of houses there are only two to six examples which would meet the criteria of tripartite houses (Fig. 2.6, 1–6). Only in two cases (Fig. 2.6, 1–2) there is no doubt concerning the presence of a NW module, as a wall foundation trench survived. At Łoniowa (Valde-Nowak 2009), one can also see an arrangement of posts which resembles "corridors" known from more westerly LBK regions, where they separate individual modules of the house (Fig. 2.6, 2; see Coudart 1998). On the other hand, in house 11 from Targowisko 16 and house 6 from Targowisko 12-13 it is possible to identify a NW module on the basis of a slightly different (denser) arrangement of internal posts, and—possibly—the presence of a "corridor" (Fig. 2.6, 3, 5). In the discussed regions there were no more examples of the presence of "corridors" which would allow an identification of a NW module. For Brzezie house 6, there is no "corridor"; instead, there is simply a slightly more regular and denser arrangement of internal posts than in the central part. According to a similar principle, house 15 from Brzezie 17 (Fig. 2.6, 6) can also be classified as tripartite. Furthermore, particular arrangements of posts in the central part are absent, for instance the "Y"-arrangement, which according to Modderman (1970, fig. 12) is characteristic only for the earlier version of type 1 tripartite houses.

The above-mentioned houses, perhaps with the exception of the house from Łoniowa, would not have been identified as tripartite if it had not been for the authority and clear criteria of Modderman's and Coudart's typologies and strenuous attempts at using them in Lesser Poland. As a matter of fact, the only trait which distinguishes these houses is the presence of a SE module. It can also be said that all houses with a SE module (including those with unidentifiable NW modules) had no doubt an exceptional status. This is due to their sporadic occurrence, exceptional length (usually about 40 m), and central position within well-examined multi-house villages of the LBK.

In summing up, in Lesser Poland the NW module is very poorly discernible and it seems that it did not have a more prominent significance in the functional partition of the house. The SE module is very well identifiable and occurs in two variants. In the "classic" variant, multiple posts are erected in a trench whose length is adjusted to the number of posts (from two to five, Fig. 2.6, 1, 4–6, 9–10). In the "simplified" variant, each post was fixed in a separate posthole, but individual rows of posts were placed in a much denser arrangement than in other parts of the house (Fig. 2.6, 2–3, 7–8).

Taking the above remarks into consideration, one can suggest a division of LBK longhouses in Lesser Poland into two types. I will henceforth refer to these types as "simple houses" and "complex houses". Simple houses are characterized by a relatively even distribution of transverse triple posts (Fig. 2.6, 11), which are only sometimes arranged more densely in the south-eastern end of the house (Fig. 2.6, 12, 14). A simple one-part house in Lesser Poland can be considered as a counterpart of one- and two-part houses in the territory of the western LBK. It is of course possible to isolate a separate group of very short houses within the group of simple houses (Fig. 2.6, 13). However, a selection of unambiguous criteria for short or very short houses would pose a problem. "Complex" houses are "simple" houses with a SE module added (Fig. 2.6, 1–10). Bearing in mind their sporadic occurrence, exceptional size, and central position within the settlement, it can be assumed that they had exceptional social significance. However, the problem is more complex, as the significance of these houses could have changed through time. In Lesser Poland's earliest multi-house settlements of the LBK, in Modlnica5

(Czerniak *et al*. 2011) and Targowisko 10-11 (Zastawny and Garabowska 2014), which are dated to the Zofipole phase (equivalent to Flomborn in the west), almost every house was provided with a SE module (Fig. 2.6, 10). In the relatively complete group of six houses at Modlnica, "complex" houses can be discerned in as many as four or five cases.

A relatively high share of "complex" houses can also be identified at Brzezie 17 (Music Note phase, Czekaj-Zastawny 2014, fig. 28). Out of 18 houses with a relatively complete outline, seven can be classified as "complex". However, as many as six of them were situated in the southern zone of the settlement, which was occupied by ten to 11 houses altogether. In the northern zone of seven houses, buildings are on average much smaller and only one of them can be classified (with reservations) as a "complex" one. In my opinion, if the northern and the southern part of this village are relatively contemporary (Czekaj-Zastawny 2014), we may be faced with an additional and more complex phenomenon, such as a division of the village into two parts which were inhabited by communities with different identities (e.g. moieties—see Van de Velde 2007, 238). At the same time, it is impossible to exclude that the southern zone may have been inhabited by a more "conservative" group (whose houses seem to be earlier) than the northern zone.Starting with the classic Music Note phase, houses with a SE module occur sporadically in Lesser Poland. In the largest village, at Targowisko 16, which is dated from the Early Music Note phase to the end of the LBK, 42 houses were examined. Among them, it is possible to isolate only three "complex" houses. All of them, including the longest and centrally situated house 11, which is 40 m long (Fig. 2.6, 3), belong to the variant with single posts. It is significant that each of these houses belonged to separate wards. All three houses were contemporaneous and dated to the second occupation phase. This means that at Targowisko 16 the occurrence of "complex" houses was a chronologically limited phenomenon and "complex" houses were not used in later phases, even though this was the largest village in the area.

At the neighbouring site of Targowisko 12-13 (Fig. 2.4), only one out of 22 houses, house 6 (Fig. 2.6, 5), had the classic SE module. It was built in phase II. At about 38 m in length, it was the longest house and centrally positioned in relation to all buildings in the village. In the following phase III a similar house (house 17; Figs 2.4 and 2.6, 9) came into being; however, at 26 m it was significantly shorter and was located in the neighbouring ward. In the latest phase (IV) one "complex" house was also built (house 7; 26 m long). It was the longest house in the village at that time. It was positioned in such a way that it partially cut through house 6, the longest and earliest "complex" house in this village (a symbolic continuation?).

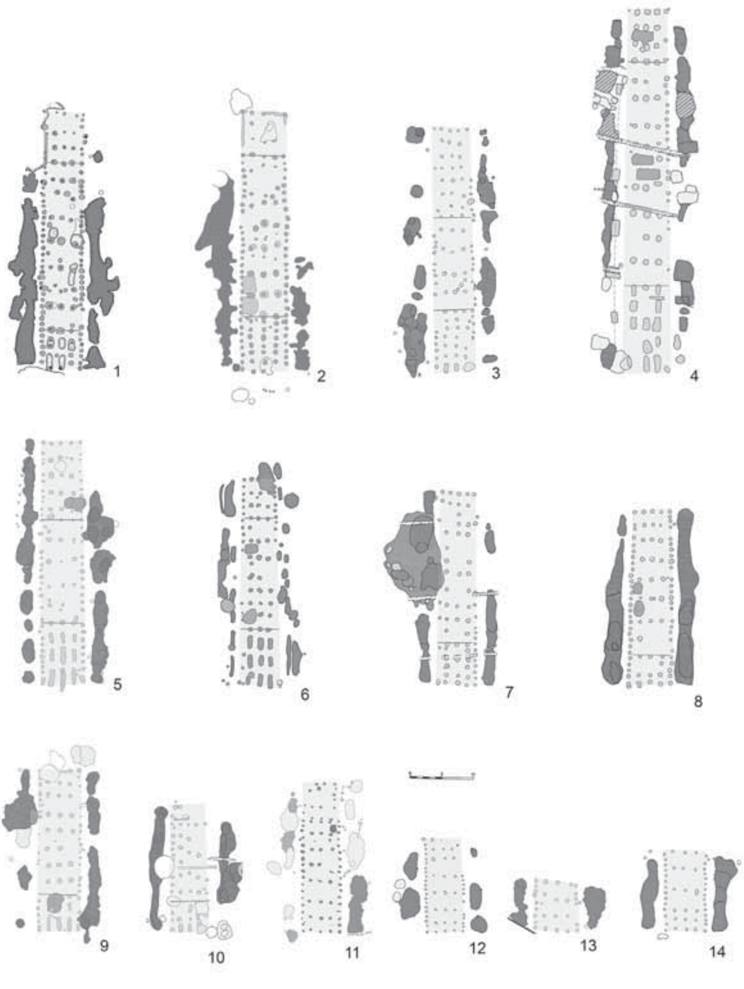

Fig. 2.6 Examples of LBK longhouses in Lesser Poland. 1 – Olszanica, house 6 (after Milisauskas 1972); 2 – Łoniowa, site 18 (after Valde-Nowak 2009); 3 – Targowisko 16, house 11; 4– Brzezie 40, house 6; 5 – Targowisko 12, house 6; 6 – Brzezie 17, house 15 (after Czekaj-Zastawny 2014); 7 – Brzezie 40, house 12; 8 – Brzezie 40, house 13; 9 – Targowisko 12-13, house 17; 10 – Modlnica 1, house A2; 11 – Targowisko 12-13, house 8; 12 – Targowisko 16, house 34; 13 – Targowisko 12-13, house 13; 14 – Targowisko 16, house 20.

At the site of Brzezie 40, dated to the Late Music Note phase, only two (at most three) of 17 houses are of the “complex” type. One of them, with a “classic” arrangement of posts in the SE module (house 6), was centrally positioned within the village and was also remarkably long, about 57 m (Fig. 2.6, 4). The other one was house 12 (32 m long), which also stood out by its generally clear internal structure (Fig. 2.6, 7).

At Olszanica, out of about 19 houses[7] only two were “complex”: house 6 with a length of 41.5 m (Fig. 2.6, 1) and house 5 (23 m). The latter was situated close to house 6 and had single posts in the SE module. Both houses were probably not contemporaneous (although pottery analysis suggests the opposite: Milisauskas 1972, 62), as—although neighbouring each other—they had a different orientation and the layout of lateral pits suggests that house 5 may have been later. House 6 at Olszanica is dated to phase II and belongs to the earlier houses within the village. This is therefore another example of a site where houses of this kind occur individually and mainly in earlier phases of building.

Summing up, in the earliest phase of existence of classic LBK settlements in Lesser Poland, “complex” houses are an almost universal phenomenon. In later phases this type of houses is sporadic. However, it stands out with its clearly higher status, and in the final period it disappears completely. Such a strong temporal correlation of the phenomenon of “complex” houses significantly limits the interpretative scope concerning the function of such houses, including the SE module which is characteristic for them. At the time when “complex” houses were a universal form, their length was relatively feebly diversified (for example, at Modlnica the three measured houses were about 21 m, 23 m, and 26 m long). “Complex” houses acquire their monumental size between 36 and 57 m (most often about 40 m) in the developed Music Note phase and later, at least to the Early Żeliezovce phase. At this point, they also become rare and take up a central position. The change therefore consisted in reducing the effort and amount of materials used for the construction of an average house and in considerably intensifying this effort in constructing special status houses. It seems, however, that this special status concerned the entire group forming a given household (e.g. the largest household in the village which enjoyed special rights related to rituals and exchange, etc.), rather than a special person (e.g. a “Big Man”), or a house of communal nature (for a broader discussion, see Czerniak 2013). Furthermore, it is difficult to associate the function of “complex” houses with particular economic choices (e.g. husbandry- or cultivation-related, see Pavlů 2013).

What, therefore, was the SE module? In my opinion—assuming that a residential second storey was present in all houses—it was some sort of open and representative porch rather than a structure supporting a granary in the second storey. It can also be suggested that the "corridor" (as understood by Coudart 1998) which is discernible in some cases and which separates the SE from the centre may have fulfilled the role of a staircase leading to the second storey. It is highly probable that transverse three-post rows, apart from supporting the second storey and the roof, may also have fulfilled the role of partition walls. In this case, however, we should try a more complex interpretation of partition of the interior of the house than that proposed by the "modular" concept. This especially concerns the NW module, which may have been divided into a series of residential and auxiliary rooms of different sizes.

Summary

For nearly 40 years, in research on the LBK there has been a dominant view that the longhouse was used for about 25 years on average by a family of six to seven persons. Such a nuclear family functioned not only as an independent household but also as an independent farmstead, which was in many cases weakly related to others at the level of village organization. Moreover, it has been assumed that the LBK longhouse was a completely autochthonous invention of local hunter-gatherer communities, who formed the LBK in interaction with farmers of the Starčevo culture. The latter assumption has significant consequences concerning proposed reconstructions of the LBK house (e.g. the question of the number and function of rooms, the presence of a second storey), which are limited to the analysis of spatial layouts of posts.

In my opinion it is possible to offer an alternative interpretation of the aforementioned issues if we assume that LBK communities derived their worldview, organization, and economy from traditions of the Anatolian–Balkan Neolithic. There are good grounds for this, among others DNA research on LBK humans and animals. Research and discussions on the Anatolian–Balkan Neolithic, carried out with great intensity over the last two decades, provide rich new data and new and much more complex interpretations of the house. This concerns all its aspects, from construction and longevity of use to its social, economic, and symbolic functions.

From the perspective of the Anatolian–Balkan Neolithic, it is necessary —in my opinion—to be not only sceptical about the evidence on which present-day interpretations of the LBK house are based, but also to find

inspiration for new data and interpretations. What is especially needed is a new discussion on possibilities of a much longer use (considering various scenarios from one to even four generations) of LBK houses and of the inhabitation of longhouses by a larger and more complex group (a household formed by, for instance, an extended family plus biologically unrelated residents, who sometimes inhabited more than one house at the same time). If we take such possibilities into consideration, we automatically open a new discussion on the organization of buildings in LBK villages, their demographic potential, and population density in general.

The main aim of this paper was to present new questions and general sketches of new hypotheses which I consider preliminary and highly incomplete. I am convinced that they are necessary to illustrate opportunities for reinterpretation, which will be brought about by further discussion. While assessing them, it is also necessary to remember their regional dimension. This concerns interpretations of the layout of house interiors, their size, and village layouts. These considerations are based on LBK sites in the vicinity of Kraków (SW Lesser Poland). They demonstrate that apart from universal traits, LBK longhouses also had numerous differences which could be referred to as regional.

In Lesser Poland, among more than a hundred well-preserved house plans, it is possible to identify only six longhouses which meet the criteria of tripartite houses. In the remaining ones, the NW and central modules are difficult or impossible to differentiate. It seems therefore that a distinction between them had no prominent significance in the functional partition of rooms in the house. A distinguishing trait of the longest houses (usually about 40 m) was the presence of a SE module of numerous and densely placed transverse posts. For this reason it seems that in this region a division of longhouses into two types, which I called “simple houses” and “complex houses” is significant. Simple houses were characterized by a relatively even distribution of transverse posts, “complex” houses had an added SE module.

The occurrences of “complex” houses display a strong chronological correlation. In the earliest phase of classic LBK settlements in Lesser Poland, “complex” houses were an almost universal phenomenon. In later phases, this type of house became rare and stood out by its clearly higher status (monumental size and central position). In the last period, it disappeared completely.

The hypothesis that LBK houses had a second storey has significant consequences for possible alternative interpretations of the modular partition of the house in the LBK and for acknowledging links to the territory of the Balkans. The presence of a second storey is well-confirmed at this time in Anatolia and the Balkans, including the Vinča culture, which shares common roots with the LBK.

Due to space constraints, this paper did not touch on the issue of "house societies" as a potential model for household social organization in the LBK (but see Bloch 2010; Borič 2008; Czerniak 2013; Gillespie 2000; Hodder 2013; Marciniak 2013; Whittle and Bickle 2013). If LBK longhouses were inhabited by multi-family and multi-generation groups (a possibility if there were a second storey, more complex internal partitions, and longer use-lives of houses), this idea provides a new and especially promising impulse for discussions on the daily life of such a complex group inhabiting a common longhouse.

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Notes

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[1] This paper is based on a presentation entitled "House and village in the Early Neolithic in central Europe. The case of the LBK in Little Poland", which was presented at the EAA conference in Plzeň in 2013 and is already published in an extended version (Czerniak 2013). Bearing this in mind and considering the editors' wish to focus on the LBK's diversity, I prepared a new paper, in which I make use of the main ideas of the original presentation, but shift attention to the problem of the social interpretation of the diversity of longhouses.

[2] The definition of household in this paper is taken from Julia Hendon: "the household could be defined as the minimal social unit that allowed certain basic personal and social needs to be filled, including economic production and the reproduction of people and institutions. Furthermore, households have a spatial referent, the house or the residential area, that archaeologists can identify and study" (Hendon 2004, 273). For archaeologists, recognizing "the residential area" remains difficult. According to Ian Kuijt *et al.* (2011, 504) "to get around the methodological problem of connecting people and social units to physical remains, many archaeologists implicitly connect the residential group with a specific single building [...but] household membership is usually fluid, flexible, changing over time, and can cross cut walls and buildings" (also: Banning 2003, 12; Hendon 1996; Souvatzi 2008).

[3] The proposed interpretation leads to two questions: how long could one house have been used and how long did one chronological phase as determined by pottery last? I believe that the time of use of LBK houses was diverse and in some cases it may even have been up to 100 years (see endnote 6). A separate issue, which is beyond the scope of this paper, is the method of phasing the pottery and of dating these phases. In this case, it can be assumed that a "pottery phase" lasted for about 75 years, but this hypothesis requires more detailed tests by means of radiocarbon dating.

[4] I use there the term "ward" in a different sense than Van de Velde (2007, 233; it is closer to his term "bunches"), who understands it as a "division of the settlement site into two sub-areas" which he interprets as moieties (Van de Velde 2007, 238). In my opinion the selection of terminology with a more universal meaning calls for a broader discussion.

[5] For a similar opinion based on new discoveries in Transdanubia, see Bánffy 2013; Marton and Oross 2012; especially at Szederkény–Kukorica-dülö: Jakucs *et al*. 2014. According to Bánffy (2013, 140) "the emergence of a central European architecture during the formative LBK phase was greatly influenced by Late Starčevo–Early Vinča traditions".

[6] For example the analysis of the sixth millennium cal BC tell of Uivar in the Banat plain in western Romania made it possible to propose a refined chronology for the tell biography. The refined dates for the use and demise of the successive houses demonstrate that house durations varied, the spans of use ranging from a decade or so up to some 50 years (Draşovean *et al*. in prep.). The study of the uppermost layers at Çatalhöyük East yielded similar results, with houses in use between one

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and four generations. This made it possible to challenge both an, admittedly largely speculative, estimate of 60–70 years as an average lifetime of a Neolithic dwelling and the sequential development of the arguably homogenous clusters (Marciniak *et al*. 2015).

[7] However, only ten of the houses were well enough preserved to allow comment on their internal structure.

CHAPTER THREE

THE NEOLITHIC LONGHOUSE PHENOMENON AT THE HRDLOVKA SITE, CZECH REPUBLIC: MEANINGS, INHABITANTS, AND SUCCESSORS

JAROMÍR BENEŠ, MICHAELA DIVIŠOVÁ
AND VÁCLAV VONDROVSKÝ

Introduction

Etymologically, the *house* can be defined as a building which serves as the ordinary dwelling place of a family (see Bailey 1990 for further details). However, one should also bear in mind that the issue of the house is dependent on a particular context, whether material or social (Bailey 1990, 22–23). With regard to the Neolithic, it has also been apparent that the longhouses should be perceived as a non-trivial phenomenon, having complex profane as well as ritual meanings (Borić 2008; Naumov 2013). Apart from a dwelling (Hofmann 2006), the house is a focal place, where the members of the household express their common identity and “structure” of society (Coudart 2015). Moreover, the house represents the locus of human activities, which can also reflect competition for prestige (Pechtl 2009). Archaeologically, such activities can be traced on the basis of artefact and ecofact distributions in order to decipher their functional and social meaning.

This contribution is not meant to be a complete review of the subject. Rather, it aims to point out some basic issues connected with the Neolithic longhouse phenomenon, focusing on the central European territory and its relation to the area of its origin. Chronologically, the work deals with the LBK (*Linearbandkeramik*) and its tradition, further developed by the succeeding SBK (*Stichbandkeramik*). The issues mentioned above are briefly discussed on the basis of the literature and our own data from the Neolithic site of Hrdlovka, Czech Republic.

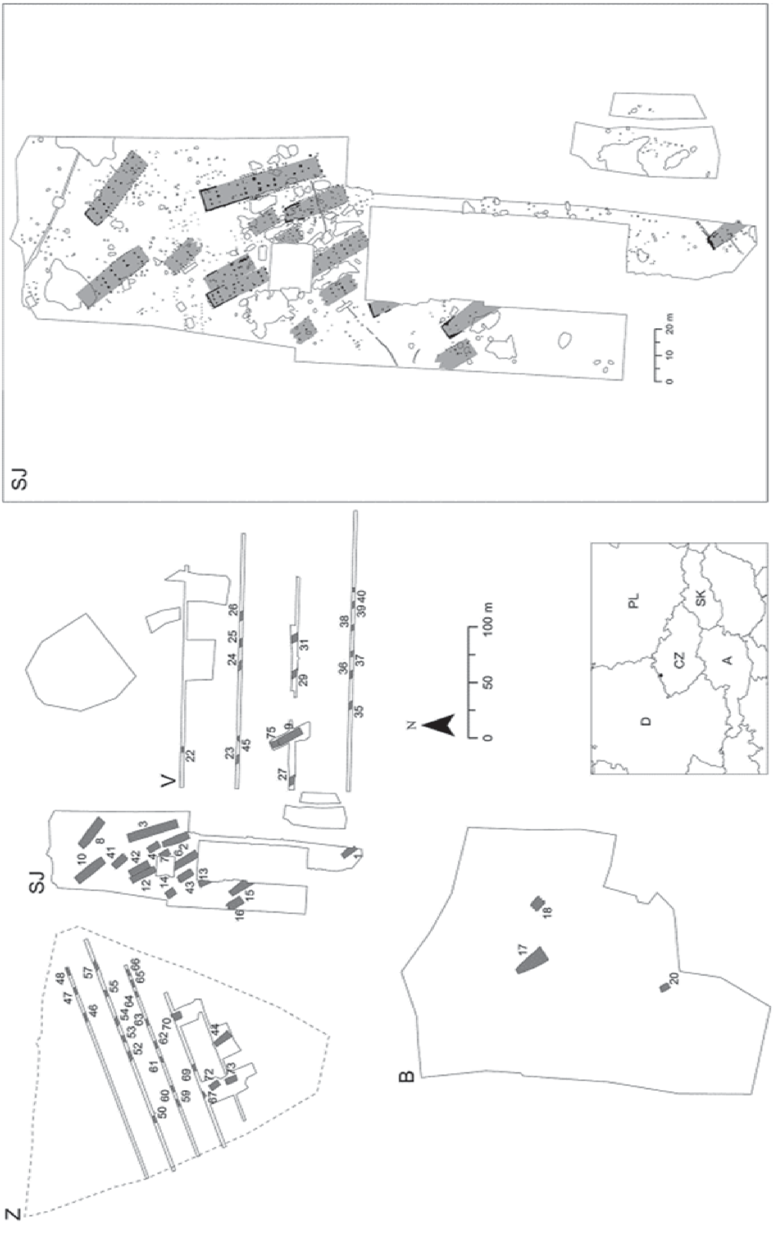

Fig. 3.1 Map of the Hrdlovka site.

The site of Hrdlovka (north-west Bohemia; Fig. 3.1) was investigated during rescue excavations between 1987 and 1990. The site offered ten Neolithic houses which could be completely uncovered (from a total of 59 houses recorded in the trenches). They provide very good evidence of architectural details, which can be used to research the development of house plans from the point of view of social and symbolic categories within the framework of Neolithic Bohemia and central Europe. Based on the ceramics from the Hrdlovka settlement area, the Neolithic human activity on the site can be dated from the Early LBK to the Late SBK, but with a hiatus during the LBK II period (for Bohemian Neolithic chronology, see Pavlů and Zápotocká 2013). Also, the house plans architectonically vary from rectangular to trapezoidal shapes (Beneš 1991a; 1991b; Beneš *et al*. 2014; Vondrovský *et al*. 2015).

The aim of this paper is thus to give an overview of LBK longhouse diversity with respect to this particular settlement. Questions regarding longhouse orientation, functional division of space, longhouse shape and construction, and last but not least the life cycle, social, and ritual meaning of the house are presented and discussed.

Orientation of longhouses

The reasons for the orientation of the LBK and post-LBK Neolithic houses have long been a traditional issue for investigation (e.g. Pásztor and Barna 2014; Pavlů *et al*. 1986). It is generally agreed that the position of the house is constrained by environmental and non-environmental factors. The orientation of LBK houses towards a specific cardinal direction was perceived as an adaptation against prevailing wind direction or other climatic effects (Marschall 1981). This hypothesis has been refuted by Elke Mattheusser (1991), who offered broad evidence and a detailed analysis from across the LBK's distribution. She suggested cultural reasons for LBK house orientations and underlined that gradual differences exist between western regions, where a north-west–south-east orientation of houses prevails, and more eastern areas, where houses are aligned north–south or north-east–south-west. In his summary of LBK house orientation in Hungary, Krisztián Oross (2010) states that Early LBK uniformity of house orientation gave way to great variability in the later LBK period. Based on the first seven phases of the LBK development at Bylany, Czech Republic, an orientation towards the west is evident. Starting from phase 9, values of each house deviate only little from the average for the whole site (Pavlů 2000; Pavlů *et al*. 1986). This indicates relative stability in house orientation, which is in accordance with other European regions.

Reasons for the relative stability in house orientation could lie in a combination of socially/ritually and ecologically constrained factors. But why is the range so restricted? The origin of the prevailing northern orientation of LBK buildings is still unknown, but some scholars have suggested an underlying influence of the Mesolithic tradition. Eszter Bánffy has collected interesting arguments concerning the location of entrances to Mesolithic dwellings, namely in the southern part of light buildings, as well as the presence of houses aligned to the cardinal directions, from north to south, in central Europe (Bánffy 2004; 2013). Such traditions could have influenced early LBK building customs. Richard Bradley has postulated that houses in the LBK were generally oriented towards the areas of origin of the communities who lived there (Bradley 2001). Cultural constrains affecting house orientation could also include an alignment towards the distant sea coast, which might be connected with the direction of the prevailing winds that brought life-giving rain (Coudart 1998, 98; Pavlů 2000, 221). Therefore, the prevailing north and north-west alignment of houses in central Europe and the westerly orientation in western Europe (Fig. 3.2) should be explained as indication of the cosmological ordering of LBK society: we suggest here an explanation combining both possible reasons of the alignment of the houses' long axis. One direction of the long axis could indicate the distant sea, the opposite direction could be related to ancestors.

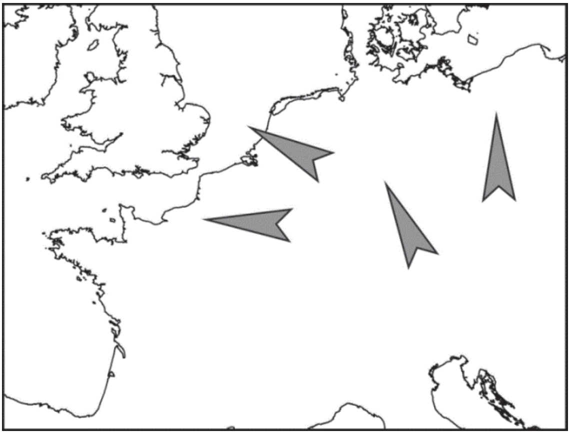

Fig. 3.2 Prevailing orientation of house longitudinal axes in LBK and post-LBK Europe.

The alignment of houses towards cardinal directions seems to be one of the crucial traits of Neolithic architecture. A combination of the social/ritual as well as ecological reasons of house orientation suggests that this phenomenon is a manifestation of the origins of people and their domestic architecture. To understand the meaning of cardinal directions, it is necessary to keep in mind the existence of interregional contacts and long-distance trade directions, which certainly did exist in European Neolithic society (Whittle 1996, 171–173). This is primarily demonstrated by analyses of raw material, for example the north Bohemian metabasite, which is the key material for the production of axes across the LBK (Šída 2006; Šída and Kachlík 2009), silicite or SGI, which was widely distributed (Kuča *et al*. 2009), or the valued *Spondylus* shell jewellery in LBK graves (Podborský *et al*. 2002). Such long-distance networks certainly sustained people's geographical knowledge and could be reflected in the canonical orientations and their durability in both LBK and post-LBK architecture.

Another question concerns the practical reasons of Neolithic house orientation. Were the Neolithic houses aligned towards specific cardinal directions also because of ecological factors? Surprisingly, this aspect is better known and discussed (Coudart 2013). It is important to note that ecological reasoning of house alignment should be studied only in conjunction with social/ritual motivations concerning house construction. Several points should be stressed. The first is an optimal house temperature regime, whereby sunshine from the east, south, and west can warm the house during the day in the harsher climate of central Europe (Pásztor and Barna 2014). The effect of prevailing winds can also be borne in mind as one of the ecological factors; however, it cannot be seen as the main reason for LBK and post-LBK house orientation (Mattheusser 1991).

The canonical orientation of central European Neolithic houses could also be the result of long-term settlement activity at any one site. This means that building and intra-site settlement continuity generated little variability in house orientation, as was observed at Bylany, where short disruptions of building activity and a decrease in population caused irregularities in house orientation (Pavlů 2000). Generally, builders of one house would aim towards smooth spatial "communication" with other contemporary buildings, arranging their house according to the alignment of neighbouring buildings. There are also buildings (maybe founded at the same time) which are strictly parallel, as at Cuiry-lès-Chaudardes (Bickle 2013; Coudart 1998; Ilett *et al*. 1982). Such cases also occur for example in Jaroměř, Bohemia (Burgert 2013) and Targowisko, Little Poland (Czerniak 2013). Twin foundations, as well as other contemporary buildings, might keep common canonical house alignment alive in the Neolithic community (Hachem 1997).

In any case, prevailing north, north-west and also north-east orientations of houses are part of the canonical LBK and partially also post-LBK architecture, expressing cultural uniformity on the one hand and architectural adaptation to climatic factors on the other. This uniformity already seems to be fully developed at the beginning of the LBK period. Later on, there is increasing evidence for the dissolution of this uniformity; however, ecological conditions constrained people to keep architectural customs vivid and persistent.

Applying this perspective on orientation to the longhouse data from Hrdlovka (Fig. 3.3), we can state that the Hrdlovka houses keep a north and north-west orientation, which is fully in agreement with the canonical architectural customs of the LBK and post-LBK (SBK) period. There seems to be no difference between the orientation of LBK and later SBK houses. This evidence suggests a smooth cultural continuation of LBK and SBK architectural and ritual customs. In this sense, the Hrdlovka site reflects a high degree of architectural uniformity.

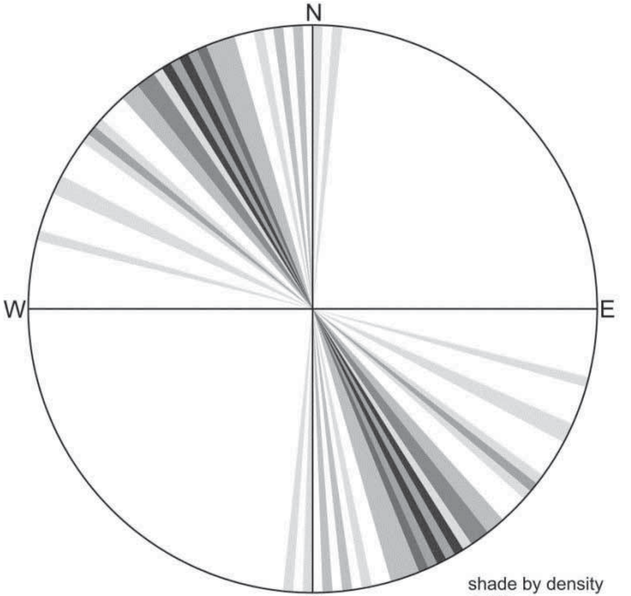

Fig. 3.3 Orientation of house axes at Hrdlovka.

Functional division of space

Since Pieter Modderman (1970) postulated the three-part division of Early Neolithic longhouses, the discussion about the function of these parts has continued. The north (rear) section is considered to be the most secluded room (Coudart 2013). Contrary to this opinion, other scholars interpret it as a storage place or livestock stable (Modderman 1970, 110). The south (front) area is considered to be an open veranda (Stäuble 1994, 201) or a room with a raised floor, where the crops were stored (Coudart 2013; von Brandt 1988, 250–257). In nearly all the models, the central part is seen as a living area, where daily activities took place.

The above-mentioned models of spatial division within longhouses are usually based on the spatial configuration of sunken features—postholes and pits. The floors of houses are not preserved, which is usually explained by erosion of the original surface (Whittle 1996, 163), but it could also indicate a raised floor (Květina and Hrnčíř 2013, 340; Rück 2009, 170–177). For a long time, the spatial arrangement of sunken features was in fact the only source of information. The organization of the postholes is certainly not random, but to reconstruct daily life, other sources of information are also needed, for example archaeobotany.

Since the 1990s, excavated ground plans have also been subjected to phosphate analyses. At Hrdlovka, building no. 44 was sampled during the excavation in 1990. The ground plan is best preserved in its northern part. It is also possible to distinguish the northern and central house sections. Associated pits in the vicinity of the house revealed mixed LBK and SBK ceramic material, therefore the ground plan is dated to the transitional LBK/SBK phase. This chronological position is supported by some details of house construction. A one-metre phosphate sampling grid covered the whole interior of the building and its closest surroundings. In order to gain a more precise result, the grid inside the house was increased to half a metre. According to the methodology of Antonín Majer (relative method of phosphate analysis; Majer 1984; 2004, 215–221) the samples were taken from a depth of at least 10 cm below the level of the overburden, because phosphate in archaeological contexts is usually detectable below its original source.

The resulting image (Fig. 3.4) shows phosphate concentrations along the western house wall. It is interesting that the concentration extends through the northern and middle part of the house. On this basis, we can suppose that the activity pattern in these two parts was not different, at least concerning the activities which produce a phosphate signal.

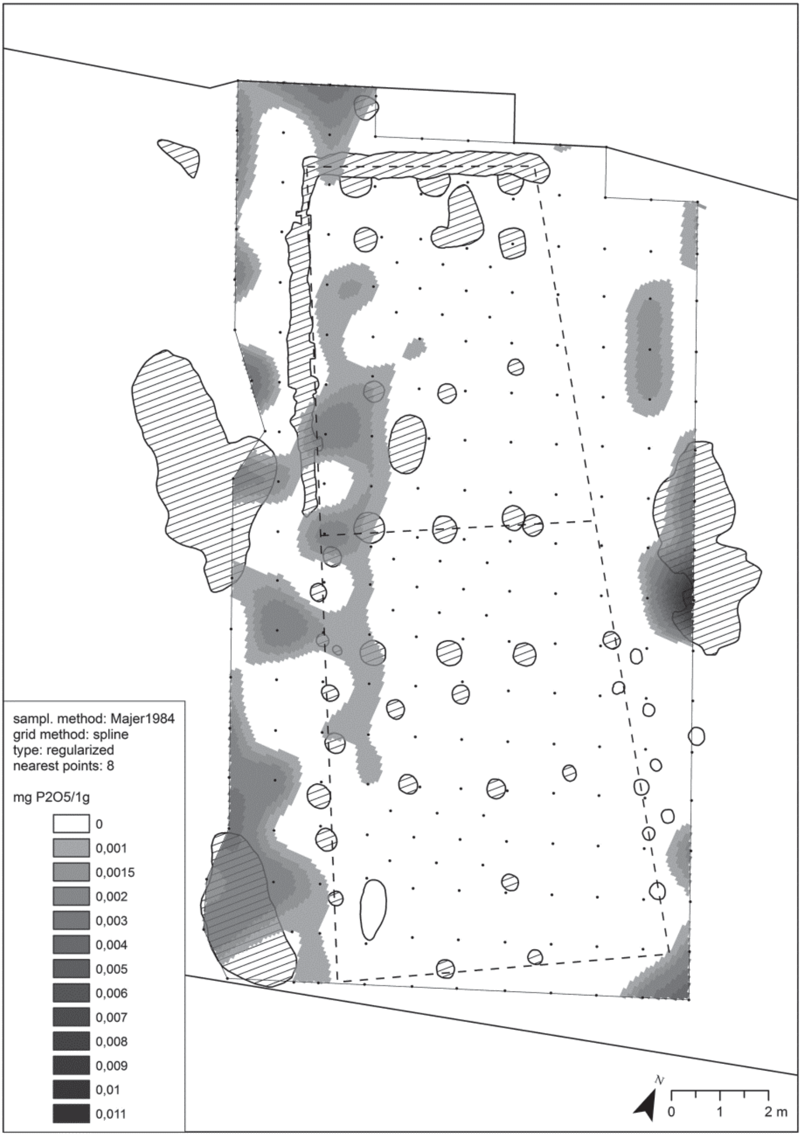

Fig. 3.4 Results of phosphate analysis around Hrdlovka house no. 44.

This brings us to the crucial point of phosphate analyses. The phosphates preserved in the soil usually come from organic materials. Therefore, phosphate analyses in longhouse interiors were usually focused on the problem of livestock stalling, where soil fertilization by animal excrements can be expected. However, phosphate in an archaeological context can also come from wood ash produced by hearths and ovens (Hejcman *et al*. 2011, 342). Except for the origin of phosphate concentrations, questions are also arising in connection with the spatial accuracy of the signal. It can reflect the centre of activity, as well as its periphery.

Up to now, not many phosphate analyses of Neolithic houses have been published, therefore comparison with data obtained from architecturally and chronologically comparable houses is problematic. Hrdlovka can be compared with the data obtained from the Early LBK houses of Enkingen, Schwanfeld, and Eitzum in Germany (Stäuble and Lüning 1999). At these sites, no signal along the wall was observed, but there was also no difference between the three parts of the house. In the building interiors, concentrations were observed along the boundaries of the individual parts. This could correspond with phosphate deposition on the periphery of the source activity. In contrast, at Vaihingen (Lienemann 1998) the phosphate values indicate different uses for the northern, middle, and southern parts. Especially in houses 20 and 35 the values differ in the northern and southern part.

To summarize, published phosphate analyses of individual Neolithic longhouses suggest enormous diversity, which likely shows variability in human activities taking place in the distinct parts of the house. It can be expected that with increasing numbers of phosphate analyses, the picture will become more precise.

Life cycle and durability of longhouses

When dealing with the issue of durability of longhouses, one should bear in mind that, archaeologically, central European Neolithic sites consist of a conglomerate of contemporary and non-contemporary houses. Although this phenomenon is observable also in the tell sites of south-eastern Europe, an important difference can be seen in the form of settlement development. Unlike the tell sites, where chronological development is clearly reflected by vertical stratigraphy, the dynamics of central European settlements are characterized by horizontal expansion through time.

A key point in this development, which is intimately bound up with the life cycle of longhouses, is the determination of the time span over which individual houses were occupied. Several models have been proposed on the basis of ceramics from loam pits, radiocarbon data, or the construction of the longhouses. These estimates vary from 25 years (Modderman 1970; Pavlů *et al*. 1986; Stehli 1989) to 100 years and more (Beneš 2004; Rück 2009).

A substantially longer duration than 25 years is indirectly indicated by the high durability of oak wood, recorded for an experimentally reconstructed longhouse in Oerlinghausen, and by direct observation of dendrochronological data and the durability of wooden constructions from later historical periods in the lower Rhine region (Schmidt *et al*. 2005). The most important statement of Burghart Schmidt and colleagues is based on the pottery chronology of overlapping LBK houses in the lower Rhine region. They argue that 99 % of houses which overlapped did so only once. In such cases, the chronological difference between the lower and upper house varied in the region of between 75 and 150 years, on average 85 years (Schmidt *et al*. 2005, tab. 4). A long duration of longhouses is also indirectly supported by palaeoecological arguments concerning the devastating effect of oak felling in the LBK period (Beneš 2004). More frequent and repeated tree felling events, which are assumed in the "shorter duration" model, would have seriously exhausted natural oak woodland and could have caused a substantial limitation of building activity (see Beneš 2004).

However, a longer durability of houses does not appear to be supported by chronological sequences based on pottery from the loam pits, which may reflect rather shorter intervals for the active phase of the house's life cycle (e.g. Boelicke *et al*. 1988; Pavlů *et al*. 1986; for further discussion see Bickle 2013, 154). The main problem connected with the issue of settlement sequences and house life cycles is the chronological sensitivity of ceramics. Moreover, Neolithic longhouse chronology is traditionally based on defining a so-called building complex (Pavlů 1977, 13–14). This approach assumes that sunken features surrounding the house were used as a garbage space by the inhabitants (e.g. Hachem 2000; Lenneis 2013; Pavlů 2000). According to other scholars, the filling process started after the house was abandoned (Květina and Končelová 2011, 214). In other words, the material from sunken features is in *post quem* relation with the active use of the house. If the estimate of a 25-year cycle is accepted, it would be problematic to assign the changes in ceramic decoration and other attributes to such short intervals. Therefore, there is disparity between the house's life cycle and ceramic cycles.

In terms of settlement space, a site's individual settlement phases cannot be seen as isolated from each other. Rather, they should be regarded as intermingled phases, just as different generations and households overlap (Bickle 2013, 154–155). The interesting notion of individual phases of the settlement's development overlapping is supported mainly by the fact that houses of different phases respect each other in many cases (Bickle 2013; Whittle 1996, 166). Such spatial relations are observed for many sites, such as Cuiry-lès-Chaudardes (Coudart 1998; Soudský *et al*. 1982, 110) or Bylany (Pavlů 2000, 295). Using the Hrdlovka example, this issue can be addressed on the basis of spatial relations at the site. The fact that the plans of houses 2 and 3, which are clearly of different ages, respect each other is particularly interesting (Beneš *et al*. 2014). This may reflect either symbolic reasons, for instance an ancestral house, or functional issues such as the presence of rubbish dumps, or the co-existence of abandoned and actively used houses (Bickle 2013, 171–172; Květina and Končelová 2011, 214). To summarize, the development of the settlement area is defined by complicated processes characterized by the overlap of the use of individual buildings, which is difficult to reconstruct.

Rectangular and non-rectangular architecture: House shape as an identity marker?

A common trend in Neolithic architecture can be observed, as the LBK is closely associated with rectangular ground plans, whereas post-LBK architecture shows more trapezoidal shapes. However, there are some exceptions which deviate from this trend (Coudart 2013). The first agriculturalists thus possibly demonstrated a new cultural identity, "being Neolithic", as postulated by Julian Thomas (2003, 69–70). As such, it could be characterized as a manifestation of self-identity in opposition to the preceding and for a long time parallel system of hunter-gatherer society (Zvelebil 2002). It seems to be the main reason why LBK architecture is so uniform across the very large area of its distribution.

Archaeological data for the end of the LBK period record some signs of dissolution of the rectangular architectural canonical form, whereby rectangular constructions are gradually substituted by trapezoidal and other "alternative" shapes. Interpreting this phenomenon, two perspectives concerning the house ground plans should be kept in mind. The first perspective is the origin of rectangular architecture itself. The beginnings of rectangular construction can be found in the milieu of the Near East PPNA/B transitional period, when it is possible to identify rectangularity as a result of long-lasting social process leading to a more sedentary and, later, permanent settlement system and stable economy (Barker 2006; Fuller *et al*. 2012). Rectangular architecture was at least a manifestation of the changing social situation in Near Eastern Early Neolithic sites (Goring-Morris and Belfer-Cohen 2013). The interior structure of settlements became denser, as clearly shown in the example of Beidha (Jordan). Here we can observe the gradual transformation of traditional circular dwellings into oval and finally rectangular houses (Byrd 1994; 2005; Kirkbride 1966). Another instructive example can be found at Shaquaret Msiad (Kinzel *et al*. 2011), where this transformation is particularly well recorded.

In the Near East, rectangular architecture became conventional from the PPNB period onwards (Kenyon and Holland 1981) and this is the foundation of Balkan Neolithic architecture (Perlès 2001; Souvatzi 2008; 2013) and in the Starčevo and Vinča cultures (Stevanovič 1997; Tringham *et al*. 1992). Very interesting in this context is the variable shape of Neolithic architecture in Macedonia, where, possibly in different ecological conditions, diverse rectangular buildings are evidenced in dryland architecture as well as lake dwellings. In this ecologically diverse region of the Balkans, some non-rectangular Neolithic buildings are also recorded (Naumov 2013; Naumov *et al*. 2009, 34–42). It is already known that Neolithic society interacted with Mesolithic groups (Nehlich *et al*. 2010), which in some areas used extraordinary architecture with trapezoidal ground plans of houses (Jovanović 2008; Radovanovic 2000). While the diverse types of houses found in Macedonia did not directly resemble the Lepenski Vir buildings, their Mesolithic origin cannot be easily excluded.

The origin of trapezoidal house shapes at the beginning of the SBK period is the second aspect to be discussed. It reflects the dissolution of canonical architectural customs in the central European Neolithic and is also evidenced in house architecture at Hrdlovka. House 3 is an example of an extraordinarily large Neolithic building (Fig. 3.5; Beneš *et al*. 2014) of the Final LBK and Early SBK period. The length of the house is 46.4 m and it can thus be considered as one of the longest houses in the area of the Czech Republic. The ground plan of the house is slightly trapezoidal (the width varies from 8.0 to 7.5 m), but it is questionable if this difference is intentional or not. Other houses from Hrdlovka dated to the following SBK phases already feature a clear trapezoidal shape. How can this be explained?

Some scholars have tried to explain why post-LBK houses were constructed on a trapezoidal or boat-shaped ground plan. According to

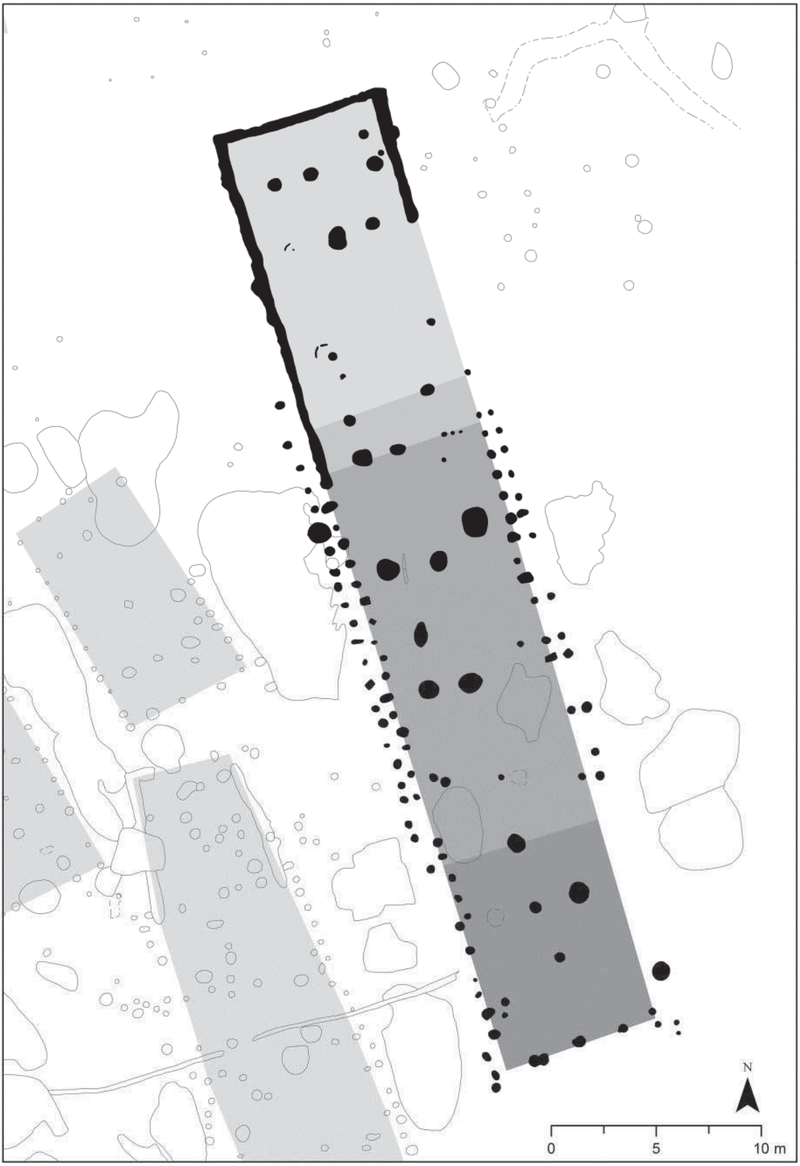

Fig. 3.5 House 3 and its internal structure.

some publications (Coudart 2013), these kinds of architecture probably made the construction more resistant. It is believed that an aerodynamic shape in particular was better adapted to climatic conditions if we assume that the rear section faced the strongest winds. Such explanations should not simply be rejected; however, they need to be carefully weighed against other environmentally-constrained explanations.

We would like to propose a hypothesis about the origins of trapezoidal houses which stresses their “non-rectangular” or “alternative” shape. We work with an idea about the renaissance of non-rectangular house building customs in the post-LBK period, even in the case of the Hrdlovka SBK. This constructional shift could be read as a slow retreat from both the knowledge of and the need for rectangular constructional customs in the LBK period. After many centuries of “conformity” associated with people being Neolithic, we can observe the decay of regularities in LBK and post-LBK architecture.

The social and ritual meaning of the house

With regard to the Neolithization process, the Neolithic house can be understood not only as an economic, but metaphorically also as a symbolic domestication of society. According to Ian Hodder (1990) the Neolithic house thus represents the *domus*, being the centre of activities (living, manufacturing, processing and storing of food, etc.) and a feminine element. The house therefore represents the opposite to the *agrios*, representing the wild and masculine environment. In other words, the wild can be seen as tamed and controlled by means of the house.

In this house-centric approach, the house is also recognized as a core place related to the family and community, embodying its technical, economic, as well as social features. The latter can be perceived in terms of houses as living bodies, sharing their symbolic and ritual attributes (Bradley 2005; Hodder 1990; Naumov 2013; Whittle 2012). The social and ritual significance of Neolithic houses has also been discussed elsewhere (e.g. Borić 2008; Naumov 2013). Primarily, phenomena such as specific cultural identity, social differentiation, and social institutions—in terms of the social and kinship organization involved—have been traced, based on the archaeological record (Borić 2008, 126; Coudart 1994).

Furthermore, the house represents a specific enclosed place, separating the household from its surroundings. The house itself can be understood as the unifying element bringing together the whole community or social unit into a discrete spatial locus, which is also known from ethnographic accounts. An interesting theoretical framework has already been developed by Claude Lévi-Strauss (1982; 1987), who defined a concept of the *house* and *house society*, emphasizing the importance of the house as a social institution (see Gillespie 2007 for further discussion). Also, ethnographic accounts show that the longhouse represents a social institution and a ritually constituted structure. The Iban longhouses (Borneo) may serve as an example. On the one hand, Iban rites are known to be connected with the house itself. These include rites that accompany house construction and preserve the longhouse as a ritual community. The second category of rites, on the other hand, represents human life, rites of birth and death. Therefore, among Iban people the whole cosmological world can be perceived through the house (Sather 2006).

Similarly, archaeological objects can be perceived as beings in terms of the human life course (Gosden and Marshall 1999; Naumov 2013, 78). In this sense, an object experiences a social life comprising three phases: creation, existence, and death (Bailey 1996). With respect to Neolithic Hrdlovka, the issue of ritual behaviour can be observed especially in case of construction sacrifices connected with the birth/creation of the house. Particularly, the exceptional hoard of grinding stones should be mentioned.

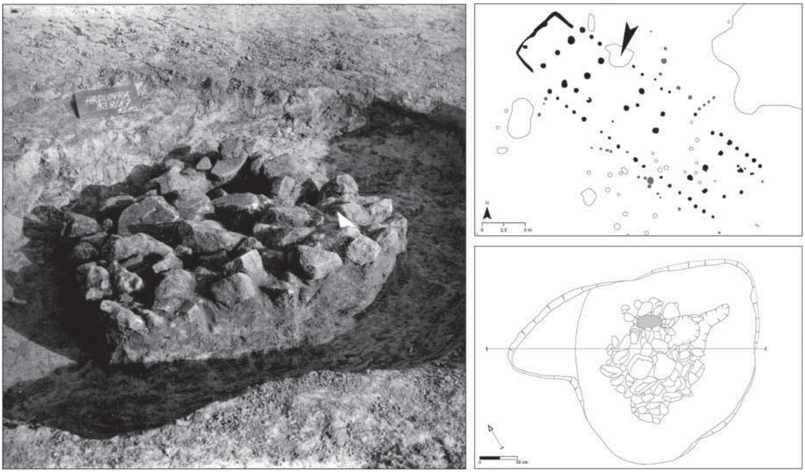

Fig. 3.6 Grinding stone deposition in Hrdlovka house 8. The scale bar in the top right image is 5 m long, that in the bottom right image is 50 cm long.

In the context of the central European Neolithic, what was discovered in the wall of Hrdlovka house 8 is unique (Fig. 3.6). One of the wall postholes was surrounded by a larger pit (feature 838) containing 35 grinding stones and their fragments. The association with the house posthole allows us to suggest that the hoard was deposited during house construction. In addition to the grinding stones, feature 838 also contained ceramics with typical Late SBK decoration. This chronological determination was supported by AMS radiocarbon dating of animal bone from the layer 50–70 cm below the topsoil. The resulting date ranges from 4620 to 4458 cal BC[1].

The phenomenon of deposition in houses and their vicinity is not unknown in the post-LBK cultural area (e.g. Lička 1981; Soudský 1969, 43) and its roots can be followed over the LBK back to the Balkan Early Neolithic (e.g. Makkay 2002, 170; Nikolov 1989, 47, Abb. 3). SBK grinding stone hoards are known for example from Holubice, Czech Republic (Kovačiková and Daněček 2008, 193–194, fig. 2), or Goseck, Germany, where, apart from the grinding stone hoard, a hoard of polished stone tools was connected with the ground plan of a longhouse (Bertemes and Northe 2010, 22, figs 17, 22). Other examples from the LBK and post-LBK period were collected in the area of northern France and Belgium and show that this phenomenon is concentrated in the west of the Bandkeramik world (Hamon 2008). Contrary to the Hrdlovka site, these hoards do not exceed ten artefacts and none of them is directly associated with house construction. The number of grinding stones in Hrdlovka highly exceeds the expected amount of these tools used simultaneously in a single household, which is estimated on the basis of ethnographic parallels as being three at most (David 1998). Therefore, it could be supposed that the hoard is an assemblage of tools from several households, maybe all households of the settlement in the given phase. House no. 8 could consequently be considered as exceptional in this context, because its construction was reinforced by such an exceptional act.

Conclusions

Although the overall uniformity of the Neolithic longhouses has been traditionally stressed, deciphering the individual aspects of this phenomenon clearly demonstrates that the finer scale brings more variable data and observable trends. The orientation of longhouses exhibits a large degree of canonical uniformity, which seems to reflect cardinal directions that were important for community life and ideology. There is also increasing evidence for regional differences in house orientations in Europe, broadly following an east–west gradient. This supports the idea that house alignment referenced the region of the ancestors on one side and the sea on the other side. The site of Hrdlovka offers several notable examples of Late and Final LBK and also SBK architecture. They exhibit continuity with the LBK in house orientation, which stresses the low variability of this trait. The prevailing north-west orientation is in agreement with the geographical setting of the site.

The internal tripartite division of longhouses can be investigated with phosphate analysis. In the case of house 44 in Hrdlovka, phosphate was concentrated along the internal western wall. Such a pattern does not indicate differentiated use of space within the longhouse parts in terms of the tripartite division. It does not support the hypothesis of phosphate accumulation as a signal of livestock stalling. Another explanation could be that phosphates accumulated in this archaeological context may also come from wood ash produced by hearths and ovens. A comparison with other LBK houses in Europe shows different patterns, signalizing that the use of internal spaces in tripartite houses was not the same everywhere.

The life cycle of longhouses is defined as the time span during which individual houses were occupied. A long duration of longhouses is indicated indirectly by several dendroecological studies underlining the durability of oak wood, the main tree used for construction in Germany and in other regions. Another important argument supporting a longer duration of LBK houses is based on the chronology of overlapping house ground plans on LBK sites, where the chronological difference between overlapped and overlapping house is on average 85 years. This issue cannot be resolved only on the basis of a chronology derived from ceramic decoration, which reflects an unknown time span.

A very important trait of LBK society is rectangular architecture. This uniformity in architecture could originate in a new cultural identity and be the main expression of uniformity. The dissolution of this stress on rectangularity at the beginning of the post-LBK period is evident in many areas. This phenomenon could be explained as the end of conformity and a possible return to non-rectangular architecture. The social and ritual meaning of Neolithic houses is a key topic for understanding their role in the life of past communities. Houses can be regarded as living bodies, having their symbolic and ritual attributes. At Neolithic Hrdlovka, the issue of ritual behaviour can be observed especially in case of construction sacrifices connected with the birth/creation of the house. Particularly, the exceptional hoard of grinding stones provides an example of Neolithic ritual behaviour associated with house building.

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Notes

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[1] 5705±35 BP; sample laboratory no. Poz-57471. The calibration was made using OxCal software and is quoted at 95.4% probability.

CHAPTER FOUR

CAPTURING DIVERSITY IN NEOLITHIC DIETS

PENNY BICKLE

Getting enough?

Subsistence has long been of concern for archaeologists studying the Neolithic. How could it not be when the practice of agriculture is, after all, a defining characteristic of the period? Yet, when it comes to consuming the products of this activity—frequently a serious social and time commitment—only comparatively limited research has been carried out (a point raised by Milner and Miracle 2002; Parker Pearson 2003; Robb 2007; Saul *et al*. 2014; Twiss 2007). As Parker Pearson (2003, 1) has articulated:

> "In a strange, almost double leap of inference, 'environmental' archaeologists have studied animal bones, for example, in order to understand not so much the consumption of the meat that they bore but the patterns of husbandry and stock-raising which produced that meat."

Nowhere, I would argue, has this been truer than for the LBK. For example, Modderman (1988, 114–115) spends two pages of his synthesis of LBK diversity discussing diet, but the focus falls on production methods and listing different food types, rather than on how different food types were consumed and valued. While there are notable exceptions to this (see below), models of diet have largely developed implicitly, with a tendency to debate how much food people produced rather than the social practices of how they ate. In the case of cereals, often thought to provide the largest proportion of the diet (e.g. Bakels 1982, 37–38), discussion has focused on the hectares of land required to feed a single household, or settlement, and how many kilograms were eaten per person per year. Building on the *Hofplatz*[1] settlement model, Lüning (1979/80; 1997; 2000) estimated a settlement of ten to 15 families would require 30–45 ha to adequately feed themselves, eating 250 kg per person, per year. Bogaard's

(2004, 159) model of small garden agriculture, assuming a comparable 300 kg for an individual's annual consumption, sees households only needing fields of *c*. 1 ha in size. Similar discussions about the management of domestic livestock have concluded that herds were managed by whole settlements rather than households to ensure survival (e.g. Bogucki 1982; Ebersbach and Schade 2005), with animal foddering adding further intricacies to this model (Saqalli *et al*. 2014). Thus, how cereal agriculture and cattle herding may have been combined has been debated (cf. Arbogast 2001; Lüning 2000), but how plants and meat were consumed and mixed in the diet has not received a comparative discussion.[2] This is not to denigrate the sophistication and importance of these discussions about quantity, as many questions around subsistence remain unanswered and continue to be priorities for future research, but to argue that determining yields and landscape carrying capacities without also considering the social practices surrounding consumption has resulted in LBK diet being a rather underdeveloped concern. Food has thus merely been the end product of subsistence activities, the inference being that eating in the LBK was only concerned with "getting enough".

Leaving food out of the discussion has thus created the illusion that there is an optimal LBK diet to be modelled. Deviances from this "ideal" level of consumption then become that which has to be explained, rather than part of the complex foodways LBK people undoubtedly practised. For much of human history (and, indeed, for large parts of the modern world), not having enough to eat would have been a regular, if not daily, occurrence. However, it would be a mistake to assume that this results in food choices solely being driven by economic rationales or determined by environmental choice alone—because what counts as enough food varies globally and over time (Pottier 1999). To demonstrate the impact of the "getting enough" premise, consider the ways climate has operated as an explanatory mechanism for diversity in food choices. As climate limits the productivity of some crop yields, environmental differences between south-eastern and central-western Europe have been credited with reducing the crop range available to LBK farmers (Conolly *et al*. 2008; Lister *et al*. 2009). In contrast, although environment was previously favoured as explaining the preference for cattle, over sheep/goats and pigs, as the dominant domestic animal, more recently this has been challenged, with cultural variation now preferred as the explanatory mechanism (Manning *et al.* 2013a). Therefore, when climatic constraints tally well with the decreased diversity found in cereal crops, no further explanation is seemingly needed, while when stock diversity appears to be influenced by factors other than the environment, it loses its explanatory role almost entirely. However, cultural practices and environmental determinants are not two entirely separate explanatory mechanisms for diversity. Thus, although climate cannot explain the particular choices of different LBK regions, nor why it was cattle and not, for example, pig or wild animals that dominated LBK animal bone assemblages, cattle are likely to have been better suited to the LBK environment than sheep/goats (Bogucki 1988; Halstead 1989; Lüning 2000), a factor that would have undoubtedly played a role in the communities' "duty of care" to their animals (Barrett 2014, 42). To be clear, my argument is *not* that climate and environment did not influence food choices in the LBK, but rather that strict either/or scenarios (where responsibility for diversity rests either with the environment or with culture), so soundly criticized by Halstead (1989) in this context, have denied prehistorians access to a complex and varied food history. Part of the reason such artificial divisions are made comes from how diversity in the past is investigated; cultural practices become the left-over diversity to be explained, once the (more easily quantifiable) explanations, such as environment and climate, have been properly accounted for. The foods produced and consumed are thus envisaged first as part of a rational adaptation to a particular setting, and as the product of historical processes of both environmental and cultural change, second (Ingold 2000, 31).

Despite complex and varied identities populating models of LBK social diversity, the literature falls comparatively silent when it comes to considering differences in Early Neolithic diet. The familiar image of settlement life, consisting of relatively independent households, each keeping a modest number of domesticated cattle, sheep/goat, and pigs alongside cultivating small plots of cereals, supplemented by wild plants and animals, is being shown increasingly to hide potentially very significant differences in practice (e.g. Bickle and Whittle 2013; Bogaard 2012; Hachem 2000; 2011; Lüning 2000), but what and how people ate, or what they did not eat, and whether there was diversity at varied scales, such as by gender, segment of community, or region, has only received limited discussion. The preparation and consumption of food have repeatedly been shown to be active in how individuals and groups mark themselves out as different, or in solidifying community and even national identities, with an extensive anthropological literature now available for comparison with archaeological data (Mintz and Du Bois 2002). Food and associated consumption practices have been used in archaeology to investigate constructions of the body, growth and health, gender, age, morality, symbolic value systems; to study group boundaries as well as hierarchies of status or skill; and to consider social competition and display, hospitality and generosity, and the construction of social memory (e.g. Dietler 1996; Milner and Miracle 2002; Parker Pearson 2003; Saul *et al*. 2014; Twiss 2007). This contribution will address to what extent diversity in dietary practices can be identified in the LBK and what role different foods may have played in the construction of variation. Newer methodologies such as isotopes and lipid analysis have provided us with new exciting avenues to pursue questions around diet, but have also shown that discussions around the social practices of food have, to date, been limited. A clear example of this is pottery analysis, which has seen a strong research focus on the typological and chronological aspects of vessels, while neglecting their role as containers of food, and the means by which food and drink could be consumed. Therefore, while the main source of evidence considered here will be isotopic data, other technologies of food production and consumption will also be drawn upon. The argument put forward is that economic and environmentally deterministic views of diet and food have been overly prevalent in the literature due to lack of consideration of the social contexts of eating and drinking, and I will aim to show that more developed and varied discussions of diversity in food and consumption are possible for the LBK.

Diet in LBK studies

Although the characterization of diet in LBK research has largely developed implicitly, through failure to afford food consumption the same space in dialogue that subsistence has received, there are several exceptions where it has been more explicitly the focus of research. Marciniak (2005, 208–210) argued that cattle (and possibly pig as well) were not consumed as “ordinary” daily food, but rather in the context of communal feasting. In contrast, sheep/goats were eaten in everyday settings and on the scale of the individual household (Marciniak 2005, 210). Marrow was also an important part of consumption, with cattle bone roasted before the marrow was extracted, and the remains of sheep/goat and cattle marrow extraction deposited separately (Marciniak 2005, 190, 209). This insight is based on an archaeozoological investigation of sites from the central Polish LBK in Kuyavia,[3] including a detailed study of how animal skeletons were being deposited in settlements (Tab. 4.1 and Fig. 4.1). Marciniak’s (2005) account of consumption practices makes three important conclusions; first, that cattle, pigs, and sheep/goats were not treated the same in the diet (as, for example, a unified “domestic animal” conceptual category opposed to “wild animals”); second, that wild animals—much less frequent in the animal bone assemblages on Kuyavia

Tab. 4.1 Marciniak's (2005, 206) suggested schema for human–animal relationships, food and depositional practices in the LBK.

	Cattle	**Pig**	**Sheep/goats**	**Wild animals**
Relations to humans	- element of social realm in domestic domain - creation of communal identity - building up stability	- creation of communal identity (?) - building up stability (?)	- ordinary (provision of meat)	- avoidance (?)
Nature of eating	- communal - deliberate selection of carcass (legless pattern) - roasted cooked marrow	- probably embedded in symbolic associations - deliberate selection of carcass (legless pattern)	- ordinary (all anatomical segments) - uncooked marrow	- not eaten (avoided?)
Place of eating	- between longhouses		- in house or around the house	
Nature of deposition	- formalised act - continuous practice - homogenous and regular	- homogenous and regular	- no deliberate pattern - heterogeneous - continuous practice	- aurochs bones deposited differently to cattle (two cases)
Place of deposition	- clay pits between longhouses		- pits around the house entrance	- pits around the house (very few bones)

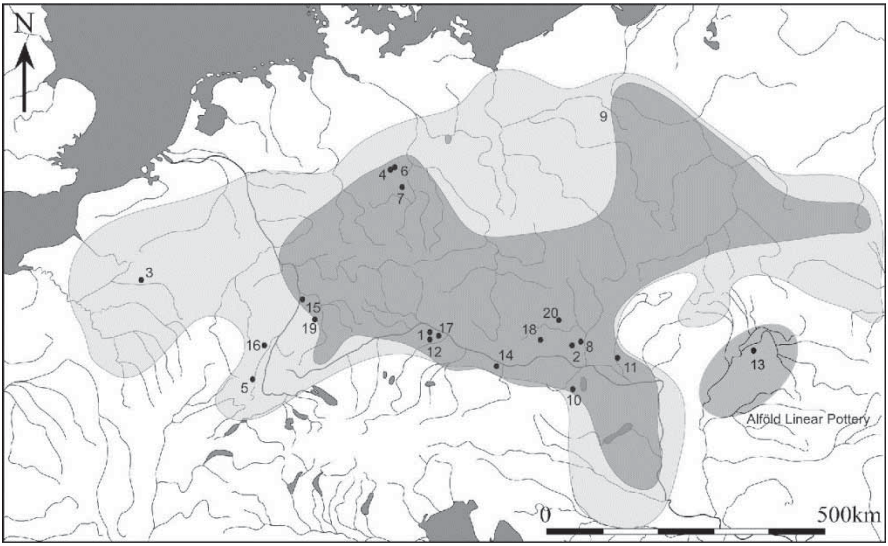

Fig. 4.1 Map of LBK distribution, with the sites mentioned in the text. The darker shading indicates the first phases and the lighter shading the second phase of the LBK. 1) Aiterhofen; 2) Asparn; 3) Cuiry-lès-Chaudardes; 4) Derenburg; 5) Ensisheim; 6) Halberstadt; 7) Karsdorf; 8) Kleinhadersdorf; 9) Kuyavia region; 10) Neckenmarkt; 11) Nitra; 12) Otzing; 13) Polgár–Ferenci hát; 14) Rutzing; 15) Schwetzingen; 16) Souffleweyersheim; 17) Stephansposching; 18) Strögen; 19) Vaihingen; 20) Vedrovice. Base map after Jeunesse (1997, 10, fig. 1).

than in some other LBK regions—were not, or only very rarely, consumed in the settlement context and probably not in feasting events; and third, following Hayden's (1996) distinction between competitive and egalitarian feasting, that communal eating was regularly practised, but may have taken place as competitive acts between households, rather than an egalitarian act of sharing or distributing food. In a wider study of food offerings in graves of the Early and Middle Neolithic upper Rhine valley, Arbogast (2014, 68) identified some trends, although it remains a very rare practice in the LBK.[4] Most "food offerings" were leg and shoulder joints of young animals (the most meaty parts), notably from pigs and caprines and only more rarely cattle, and associated with "rich" graves, where they were placed near the head (Arbogast 2014, 68–69; Fig. 4.2). Together, Marciniak's (2005) and Arbogast's (2014) analyses challenge simple and direct readings of the faunal assemblages; because cattle is the most numerous animal it should not automatically follow that it was valued in the same ways, in all contexts.

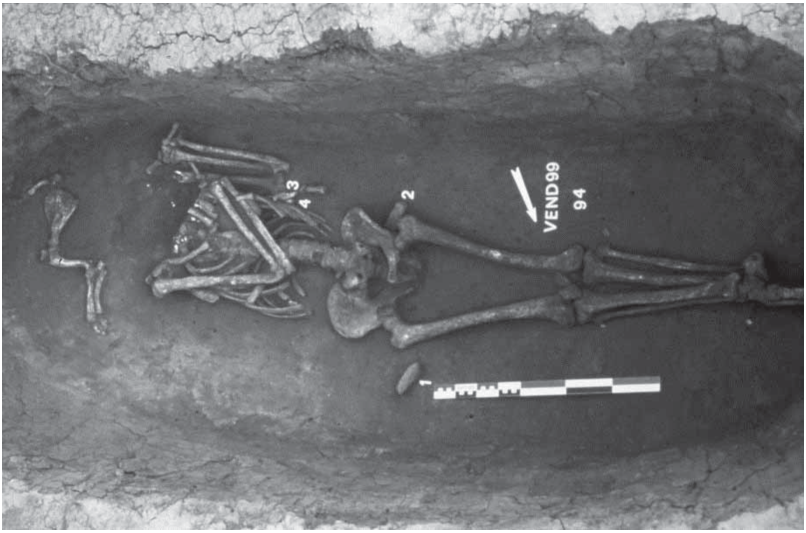

Fig. 4.2 Burial 94, Vendenheim, Lower Alsace, with left shoulder and upper leg of pig (top of photo). Accompanied by two polished stone adzes (identified as 1 and 2 in the photo) and two further lithic tools (a large blade, 3, and a rough flake, 4). Photo: François Schneikert, INRAP.

The second exception to the implicit assumptions made about LBK diet is the growing contribution from bioarchaeology, taken directly from the human skeleton, from the stable isotopes of carbon and nitrogen, from strontium and oxygen isotopes, or from non-human contexts (e.g. animals and pottery). While this is by no means a static field of research and there remains much more to understand about the complex relationship between diet, human physiology, environment, and the isotopic ratios found in skeletal material (Hamilton *et al*. 2013, 30; Hedges and Reynard 2007), it has provided an alternative avenue to considering diet, with several key observations arising. Carbon and nitrogen isotopic analyses of human and animal remains have suggested a largely terrestrial diet, consuming C_3 plants[5], with some possible differences in the rate of fish consumption (Asam *et al*. 2008; Dürrwächter *et al*. 2006; Hedges *et al*. 2013; Oelze *et al*. 2011; Richards *et al*. 2008). In a recent study of over 600 individuals from across the LBK, Hedges *et al*. (2013) were able to further quantify the LBK diet. Their model cautiously suggests that animal protein made up no more than 50 % of the diet in the Rhineland region, while in the eastern part of the LBK and along the Danube this value dropped to about 25 %, with a greater proportion of pulses, but overall the picture is one of homogeneity (Hedges *et al.* 2013, 365).[6] Through comparison with the isotopic data from faunal remains, the largest proportion of animal protein in the diet is thought to come from domestic rather than wild animals (e.g. Hedges *et al*. 2013; Oelze *et al*. 2011; Richards *et al*. 2008). The proportion of meat in the diet has been questioned recently, as the practice of manuring has been shown to enrich the nitrogen isotopic ratio of cereals (Bogaard *et al*. 2007). Compound-specific analysis is likely to provide further detail in the future (e.g. Styring *et al*. 2010). Although a largely homogenous diet is suggested by these data (Hedges *et al*. 2013; Oelze *et al*. 2011; Richards *et al*. 2008), some variation in isotopic ratios has been identified and interpreted as signalling unequal access to meat based on status, age, or sex (Zvelebil and Pettitt 2008, 208).

Strontium isotope ratios, first developed as a proxy for human migration (Bentley 2006), have also recently been providing insight into diet. Strontium isotopes inform on mobility, as the ratio of two strontium isotopes (86 and 87) remains unchanged as it passes from the underlying geology into water systems and up the food chain into the human skeleton (Bentley 2006). However, given that food can be sourced from multiple locations and environmental contexts, the data from strontium isotope ratios are likely to provide a direct indication of mobility patterns in only a few scenarios and diet is hence an important consideration when interpreting the data. Acknowledging this complexity, Bentley (2013; Bentley *et al*. 2012) has argued that strontium isotopic ratios in the LBK context inform on landscape use and subsistence practices, as well as human mobility. Recent lipid analyses of LBK pottery have also produced significant insights into diet. Sieves and perhaps also open bowls demonstrate the processing of dairy products, while other pots were used for cooking/storing mixed meat fats (Salque *et al*. 2012; 2013).[7] Some regional diversity in consumption practices may also be visible amongst the lipids, with more non-ruminant fat (e.g. pig meat) signals in Bavaria than elsewhere, though the low number of samples urges caution when making further inferences (Salque *et al*. 2012).[8] Mixtures of different fats within the same pot type, suggested by the presence of mixing lines (Salque *et al*. 2012, 55, fig. 7), hint that there were no proscribed social rules which encouraged the separation of different foods into exclusive categories (e.g. a cultural prohibition on mixing different meat and dairy products, at least in pottery, was not present in the LBK). Variation is thus demonstrable, but whether different subsistence practices extended into a variety of foodways across the LBK remains an open question. To investigate this further here, three aspects of dietary variation will be discussed: regional variation, sex-based differences, and community and group diversity.

Dietary variation in the LBK

Regional difference

How diet intersects with regional variation is not clear on the basis of current evidence. Overall, the isotopic data suggest very little difference in diet on the scale of the region. Despite sampling across roughly ten different LBK regions (as identified in ceramic styles), Hedges *et al.* (2013) found the stable isotopic data suggested a largely homogenous diet. Some differences between the Rhine and Danube valleys could be identified, in terms of the difference between humans and animals, relating perhaps to differences in meat consumption, and individual sites stood out from others in various ways, but clear differences in diet are not apparent at the regional scale in the isotopic data (Hedges *et al.* 2013, 361, 363). However, stable isotope data reflect average animal and plant protein contribution to the diet and cannot show differences in composition in overall content (e.g. two regions could have the same amount of meat protein in their respective diets, but one could be eating only cattle and the other only pigs) and therefore the homogeneity of the isotopic data does not exclude the existence of some regional patterning in food consumption. Lipid analysis of pottery vessels, which is currently under way, may go some way to clarify this in the future (e.g. Salque *et al.* 2012). Therefore, while these data cannot provide more detailed information about whether people were eating the same animals or plants, it does suggest that conceptions of what constituted "food" were widely shared. Furthermore, given that some cemeteries are likely to have lasted over multiple generations (e.g. Griffiths 2013), this suggests that there was continuity in diet composition over time, with little change over the 500-year or so duration of the culture. This observation is in distinct contrast to the well-mapped regional variations in both the faunal assemblages and plant species distributions (Arbogast *et al.* 2001; Bogaard 2004; Döhle 1993; Knipper 2011; Kreuz 1990; Lüning 2000; Manning *et al.* 2013a; 2013b), providing a potential disjunction between diet and subsistence practices.

It is worth at this point briefly reflecting on how regionality has been identified and interpreted in other classes of evidence. Regional pottery styles, perhaps the first form in which geographical and temporal diversity were recognized (Modderman 1988, 69), are accompanied by correspondingly regional, though not always overlapping, differences in longhouses, burial rites, animal husbandry, horticulture, raw material use, and technologies (e.g. Bogaard 2004; Coudart 1998; Döhle 1993; Jeunesse 1997; Lüning 2000; Mateiciucová 2008; Ramminger 2007). However, few of these categories of evidence differ in the same manner. For an example of this, we can compare variation in pottery to that found in longhouse architecture, as well as how such diversity has been interpreted by researchers. Broader chronological and regional ceramic decorative schemes, such as Flomborn or *Notenkopf*, can be further subdivided several times (Gronenborn 1999, 185), analogous to a fractal pattern (Fowler 2008, 49). Hence, region, clan, and household are seen as providing the LBK person with a nested Russian doll-like identity expressed through the medium of pottery decoration (Risse 2004, 250; for an LBK example see Strien 2000). In contrast, architectural diversity appears to have a different mode of operation altogether. Again regional differences are visible, but, unlike pottery, geographically restricted stylistic elements are rarely found (Coudart 1998; Hofmann forthcoming). Rather variation is seen in the degree to which certain aspects of longhouse design are favoured, emphasized, or ignored (Hofmann forthcoming). The responses to these differences are varied. Van de Velde (1990) and Pechtl (2009a) have argued that longhouse length was utilized by high-status households to demonstrate their social rank. Similarly, Hachem (2000; 2011) found a correlation between variation in the archaeozoological assemblages and longhouse lengths at Cuiry-lès-Chaudardes, but suggests identity differences based on economy rather than hierarchy. In contrast, Coudart (1998; 2015) downplays the significance of such variation, interpreting the overall similarity of longhouse architecture as deliberately deployed in the maintenance of collective identities in an egalitarian society.

That LBK regions are largely defined by decorative schemes on pottery is a point worth stressing here, as there is a tendency, particularly in LBK studies, for regional pot styles (specifically variation in decoration) to become the principal or foundational classification of a region. Therefore, regions are depicted as repeating the diverse kinds of relationships envisaged at settlements; kin groups are often inferred from networks of exchange, in pottery (Claßen 2009; Strien 2000) and in lithics (Claßen 2009; De Grooth, this volume). Sets of values are thus seen to hold at every scale, from the individual, through the settlement, to the wider region. Pottery is thus characterized as an extension of identity in the same way for the individual potter as it is for the region as a whole. By leaving such configurations of LBK practice as implicit and fixed, regions become reified into concrete and bounded wholes. Regional variation in subsistence practices is therefore treated as a valid scale of comparison, without creating an adequate model for how regions were valued by LBK communities and asking whether subsistence or diet fed into the broader-scale creation of identity. Care must therefore be taken not to allow differences to become essentialized or translated wholesale into ethnic or cultural groups without further consideration of the contexts in which particular material classes are being used and how they integrate into other types or forms of data (Hofmann and Bickle 2011).

Dietary variation may not therefore have mapped directly onto other regional differences, e.g. in material culture, but currently this is hard to assess. Approaches to pottery beyond its presence as a chronological marker are rather thin, though Van de Velde (2007, 120–121) is a notable exception, and this is changing, as for example shown by Gomart's (2014) exceptional investigation of pottery production techniques. In the animal bone assemblages, regional variation is mostly found in the proportion of wild animals present on sites and in the species occupying the position of the second most frequent animal (cattle bones most frequently dominate the assemblages; Knipper 2011). These patterns may well be influenced by taphonomic issues, such as the greater survival of larger cattle bones, where in the landscape wild animals were butchered, and how domestic animals were managed. For the plant remains, with some exceptions such as poppy and lentil, the regional variation is again found in the proportion of a select range of species present—it is a matter of degree rather than absolute values (Lüning 2000, 60–61), more akin to the patterns discussed above for longhouses than for pottery. Marciniak's (2005; Tab. 4.1) suggestion that wild animals were not consumed at sites in central Poland may not therefore translate to regions such as Baden-Württemberg and Bavaria, where it has been estimated that approximately 40 % of the animal bone comes from game (Knipper 2011, 34; Lüning 2000, 115). These regions also see greater preference for pigs (Knipper 2011; Lüning 2000). Bavaria and Baden-Württemberg do not, however, represent a unified material culture; rather there appears to be somewhat of a border between the two regions in terms of pottery and raw material circulation, as well as different trajectories from the Mesolithic (Hofmann *et al*. 2013). Therefore, the intention here is to explore two other contexts in which dietary variation is apparent and consider how diet may have played a role in the creation of certain forms of diversity.

Sexed difference

Proposed interpretations for diet variation based on sex largely divide into two categories in archaeology; division of labour based on sex, for instance men eating meat while hunting, and access based on status, for example men consuming greater quantities of meat (Turkon 2007). Perhaps because of this, when isotopic differences between males and females are apparent in the data the most frequent explanation is that male diet was more meat-rich due to men having a perceived higher status than women (Nitsch *et al*. 2010, 3192, tab. 1). Alternative explanations based on physiological differences have also been put forward, as when differences do occur males consistently have higher δ^{15}N isotope ratios (e.g. Nitsch *et al*. 2010). However, biological explanations are currently thought to be unlikely as male–female isotopic differences are not consistent in LBK contexts, varying from sites where males have significantly enriched δ^{15}N to cemeteries with parity between the sexes (Hedges *et al*. 2013, 355). From the LBK, Hedges *et al*. (2013, 354) found that the three sites where significant sex-based differences were present clustered in the region of Moravia (Vedrovice), Lower Austria (Asparn), and western Slovakia (Nitra), all broadly belonging to the *Notenkopf* ceramic tradition. This region sees relatively low rates of variation in body orientation and position in the grave (Hedges *et al*. 2013, 377, tab. 9.9), perhaps suggesting that differences in life were downplayed in the funerary sphere in this region. This pattern may speak to the extent of shared practices, differing from elsewhere in the LBK distribution. If women were moving as part of post-marriage residence practices, as has been hypothesized elsewhere (e.g. Bentley *et al*. 2012; Eisenhauer 2003; Van de Velde 1979), this could show the extent of the area in which women moved. Oelze *et al*. (2011) found that while there were no statistically significant differences in diet between males and females at the sites of Derenburg, Halberstadt, and Karsdorf, Saxony-Anhalt, females exhibited a significantly greater range of δ^{15}N isotope ratios. Significant male–female differences in carbon isotopic ratios are much rarer in the LBK and only present at one (Ensisheim, Alsace) of the 20 sites analysed by the *LBK lifeways* project, suggesting any differences in male–female diets were found largely in meat protein consumption rather than in the contribution from plant protein (Hedges *et al*. 2013, 355), with women having more varied rates of protein in their diets. Therefore, while the relative status of men and women has been mooted as a reason for the variation seen in isotopic values, in the LBK context there is unlikely to have been a straightforward division of higher-status male and lower-status female foods. Rather, a far more complex interaction of relative social position and sexed experiences can be envisaged.

A similar debate has taken place around dental caries rates at the transition to farming, with women frequently exhibiting poorer oral health than their male counterparts, with both dietary differences (variation of carbohydrate in the diet) and physiological differences proposed as explanations (Lukacs 2008). Such debates have deflected attention away from exploring diversity between the sexes, as they appear to provide clear either/or routes to a single answer—either the variation is a result of biological processes and therefore is not useful for understanding social diversity in the past, or the data pattern arises in dietary practices, requiring a cultural explanation. Lukacs (2008, 909) has demonstrated the complex number of factors which influence susceptibility to caries, including tooth development history, oral ecology (e.g. saliva), diet composition, and behavioural factors (e.g. food preparation), all of which potentially intersect with variation in sexed lifeways, both biologically and culturally. A more productive focus is to shift attention on to how such differences may have impacted on the practices associated with food and varied experiences of the human body. Tooth decay can be painful and limiting, influencing food choices as well as physical activity rates, ultimately resulting in tooth loss, but far more research has focused on detailing the pathology rather than the human experience. If a greater proportion of women were suffering the impact of caries, this may well have framed both the bodily experience of women during their lifetimes (e.g. periods of pain) and variations in their diet. In the LBK context, a higher proportion of women suffered from dental caries, significantly so at Polgár–Ferenci hát, Transdanubia, and Nitra, Slovakia (Hedges *et al*. 2013, 371). At Polgár, about 50 % of the analysed female individuals suffered from caries (eight individuals from 14; Whittle *et al*. 2013a, 78), while at Nitra, this rate rose to 72 % (18 individuals from 26; Whittle *et al*. 2013b, 145; Fig. 4.3). This pattern of higher caries rates for women was also repeated at the Vedrovice cemetery, Moravia, where dental microwear suggested that the female diet could include meat, but was frequently mixed with a higher vegetal content than that of males (Lillie 2008, 139–142). In a few cases those with caries had eaten a soft diet (Lillie 2008, 139–142) characteristic of agricultural societies and which has been connected to the introduction of pottery (e.g. Nystrom 2008, 163), perhaps indicating a longer cooking time or stewing. In these communities, more women than men could have sought out or consumed food influenced by their oral health, again leading to women having a more variable experience of diet. It is interesting to note that these three sites show some partial overlap with the sites where females had lower average $\delta^{15}N$ isotope ratios—women in eastern LBK regions could have consumed more plant-based foods than men, a pattern that did not translate to more western regions.

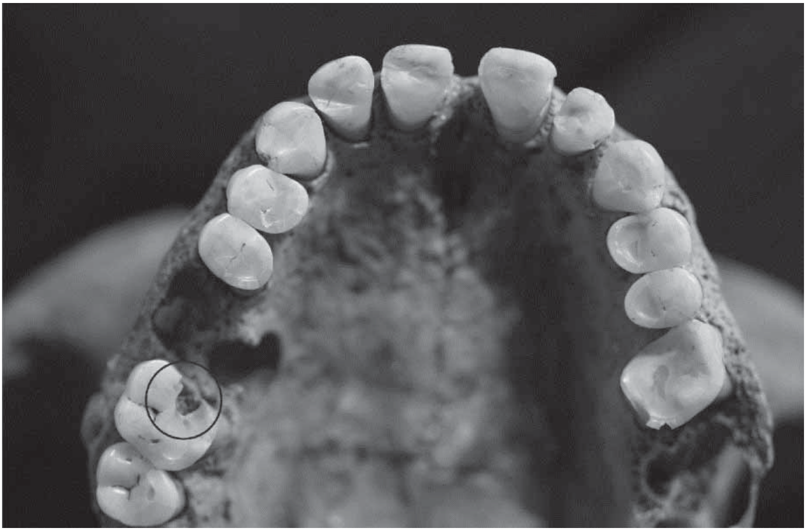

Fig. 4.3 Maxilla from an older adult female buried at Polgár–Ferenci hát (burial 281/444). Circle indicates the presence of a carious lesion on left second molar. Photo: Linda Fibiger.

Comparison between skeletal stress markers, *cribra orbitalia* (more frequent in women), and enamel hypoplasia (recorded in the tooth during formation, i.e. childhood) has led to the suggestion that sex-based differences in diet only arose in adolescence (Hedges *et al*. 2013, 371). The picture arising from this evidence is that women were more likely to have suffered as a result of poor diet than men. If food access was variable over time, with periods of famine, were women disproportionately affected? Another possibility is that food taboos existed for some women. Pregnancy, menstruation, and rites of passage such as marriage and mourning can be associated with food taboos (Douglas 1966; Simoons 1994). Meat avoidance during pregnancy or menstruation may be one such possibility; both the foetus and menstrual blood can be powerful and dangerous, requiring careful attention when producing and consuming food, or engaging in activities such as hunting (Douglass 1966, 119; Politis 1999, 107). However, as discussed above for pottery, it is important here not to essentialize sex-based differences, as the stable isotope evidence suggests that dietary differences were a matter of degree rather than exclusive. Outlying individuals can also be identified in the stable isotope data, and they are likely to have had a different diet from the rest of their community, e.g. the young adult female from the Kleinhadersdorf cemetery who may have incorporated rare C_4 plants such as millet into her diet in greater proportions than the rest of her group ($\delta^{13}C = -18.7$; Bickle *et al.* 2013a, 176). Such extremes are unlikely to be associated with differences in sex-based practices, but perhaps speak to other variations in lifeways.

Community difference

Although the overall similarity of isotopic data must be emphasized (Hedges *et al.* 2013), some rarer group variations can be identified. It is interesting to note that where cemeteries studied for the *LBK lifeways* project did show some group variation, it was most frequently in the carbon isotope ratios rather than nitrogen isotopic data (e.g. Rutzing, Bickle *et al.* 2013a, 196; Aiterhofen, Hofmann *et al.* 2013, 235–236; Otzing, Hofmann *et al.* 2013, 345; Schwetzingen, Bentley *et al.* 2013, 282; Souffleweyersheim, Bickle *et al.* 2013b, 325), thus contrasting with sexed differences. At the Rutzing cemetery, Upper Austria, there was a significant difference in the carbon isotopic values between the north and south clusters of burials (northern group $M = -20.6$ ‰; southern group $M = -20.4$ ‰ if the outliers are excluded; 2-tailed t-test, $p = 0.04$, $n = 18$; Bickle *et al.* 2013a, 196; Fig. 4.4). It is a small and slight difference, but suggests that there were some variations in plant protein consumption between the two groups, most likely to have arisen from sourcing food from different locations in the landscape (Hedges *et al.* 2013, 354). This variation is unlikely to be linked to consumption of different food types (e.g. fish), as there is no corresponding differentiation in nitrogen isotope ratios (Hedges *et al.* 2013, 354). One potential explanation for this carbon isotopic variation is that it originates in the “canopy effect”, which results in foods sourced from more wooded landscapes having lower $\delta^{13}C$ isotope values (Hamilton *et al.* 2013; Hedges *et al.* 2013; Lynch *et al.* 2008). Two interpretations for the variation found at Rutzing can be suggested. First, the two clusters could represent two burial phases, between which the landscape, or food sourcing practices, changed. Second, the burial clusters could be two contemporary groups sourcing the plant protein proportion of their diet from different environments (see further discussion in Bickle *et al.* 2013a). Whichever interpretation is favoured, the evidence suggests that while the amount of meat protein was widely shared at the scale of the

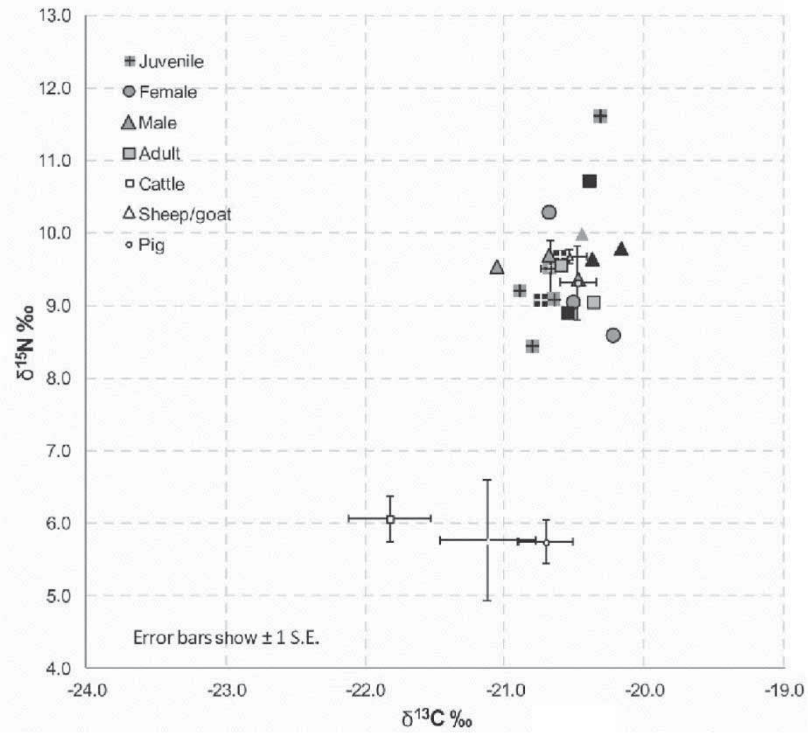

Fig. 4.4 Carbon and nitrogen isotope ratios (‰) of humans from the Rutzing cemetery, Upper Austria. Individuals buried in the southern cluster are depicted in black (black triangles for males, black square with a white cross for juveniles). After Bickle *et al*. (2013a, 198, fig. 5.29).

community or burial group, plants may not have been. This observation ties in with the model proposed by Bogaard *et al.* (2011) for Vaihingen, where different groups at the settlement were practising different intensities of cereal farming, perhaps influenced by the distance fields were from the settlement. Unlike animals, plants in the LBK diet may have been more wedded to particular groups and particular locales in the landscape—cereal plots were long-lived (Bogaard 2004). A similar pattern in the strontium isotope data from Aiterhofen, Lower Bavaria, was also thought to arise from a similar variation in landscape use (Bickle *et al.* 2011). Together, this evidence suggests that against a backdrop of widespread shared diets, space should be made for more intimate, around the hearth, consumption practices in smaller groups. It remains to be seen whether differences in diet could be recognized at a household level—perhaps through varied tastes and textures of particular food types such as bread or stews (Bickle and Whittle 2013, 16), the particular smells of boar or beef roasting (Hachem and Hamon 2014), or beyond the settlement itself, with certain foods associated with particular taskscapes, e.g. hunting (Bickle 2009) or fishing, indicated by the sites of Felsdach Lautereck (Taute 1966) and Liège Place-St.-Lambert (Otte 1984).

Diversity at the scale of the settlement has also been demonstrated recently at a number of intensively studied sites, most notably at Vaihingen (Bogaard 2012; Bogaard *et al*. 2007) and Cuiry-lès-Chaudardes (Allard *et al*. 2014; Hachem 2000; 2011). At both sites, inferred subsistence differences have been interpreted as households or groups within the settlement pursuing different crop management or herding/hunting strategies respectively, rather than consuming substantially different diets *per se*. Therefore the presence of a widely shared and similar LBK diet, as borne out by most stable isotopic data (e.g. Dürrwächter *et al*. 2006; Hedges *et al*. 2013; Oelze *et al*. 2011), may not be a surprise. Nonetheless, the contrast between a broadly uniform intake of animal and plant protein and the variability in subsistence practices leaves open how the production and consumption of food on the scale of the community were interconnected. In other words, if households were arranging their subsistence activities individually, why does this not translate to the stable isotopic data? There may also be an issue with the resolution of stable isotopes, which could blur some more subtle but significant differences in consumption practices (Styring *et al*. 2010). Despite these caveats, some interesting observations can be made about how food and diet may have functioned in LBK communities. Importantly, such homogeneity indicates that the analysed communities were not composed of different dietary groups. So, consumption practices and foods were unlikely to have differed between those who identified with (or traced their descent from) either incoming farmers or indigenous hunter-gatherers (Bickle *et al*. 2011).

Furthermore, the data caution against seeing access to certain food types as carefully controlled or restricted to certain groups, but rather point towards consumption of food taking place at scales beyond the individual household. Sharing residence and sharing food can be deeply connected; it is at the table or around the hearth that kinship and household membership can be fostered and reinforced (Carsten 2004, 40), yet in the LBK there may have been other salient scales at which eating together operated. There is evidence that can be pointed to here, of group cooking or food processing activities taking place at settlements. Pechtl (2008, 68, 77) has surveyed the preserved pit ovens and hearths at LBK settlements (e.g.

Stephansposching, Lower Bavaria; Fig. 4.5), establishing that they cluster together, away from houses in open spaces, and concludes that these fire settings were communal features shared by a group of houses. While perhaps not being in daily use (Pechtl 2008, 77), such features point towards moments at which the community was coming together not just to eat, but also to prepare food—times at which methods and knowledge of food, recipes, and modes of etiquette could be negotiated and shared between different households (Kalogiropoulou 2013). At this point it is worth returning to the argument made by Marciniak (2005, 206; Tab. 4.1) for the consumption of cattle in the LBK, arguing that cattle were eaten in competitive feasting events. However, as stable isotopes from bone collagen represent a cumulative average of the dietary protein over the last 10–20 years of an individual's life (Hamilton *et al*. 2013, 31; Hedges and Reynard 2007), the isotope data represent a shared parity in long-term day-to-day consumption and cannot account for seasonal variation or restricted access to food items in non-routine events such as feasts. The overall long-lived similarity of diet across the LBK duration, however, speaks to the importance of a shared diet and the presence of opportunities to reinforce value systems around food.

Although Marciniak (2005) argues that such feasts were competitive, this does not mean they were necessarily divisive. Competition can act to create and stabilize communal identities, as shared value systems and understandings are required in order to be able to participate in the competition (Hayden 1996). Wilk (2004, 91) outlines this argument in his analysis of beauty pageants in Belize, which developed as copies of comparable events held in the USA. He established two forms of common values that have to be in place in order for the competition to go ahead—not only does there have to be a mutual concept of "beauty", but also a shared understanding that it can be ranked and hence a context within which to compete (Wilk 2004). However, as Wilk (2004, 92) observes, participation in such events did not make the Belize any less "Belize" or Americans and Belize more alike, nor did a shared notion of a "female aesthetic beauty" make everyone look alike; "the *content* of the category of beauty has changed, but the *dimensions* have not" (Wilk 2004, 92, original emphasis). Wilk (2004) calls this process "*common difference*": that which provides shared standards and vocabularies allowing diverse groups to participate together. Rather than Belize pageants working within a set of categories imposed from the outside, it is the systems of value that operate within the pageants that have been appropriated. In a similar fashion, feasting and moments of competition within LBK communities may have functioned to reinforce the shared values around food and the

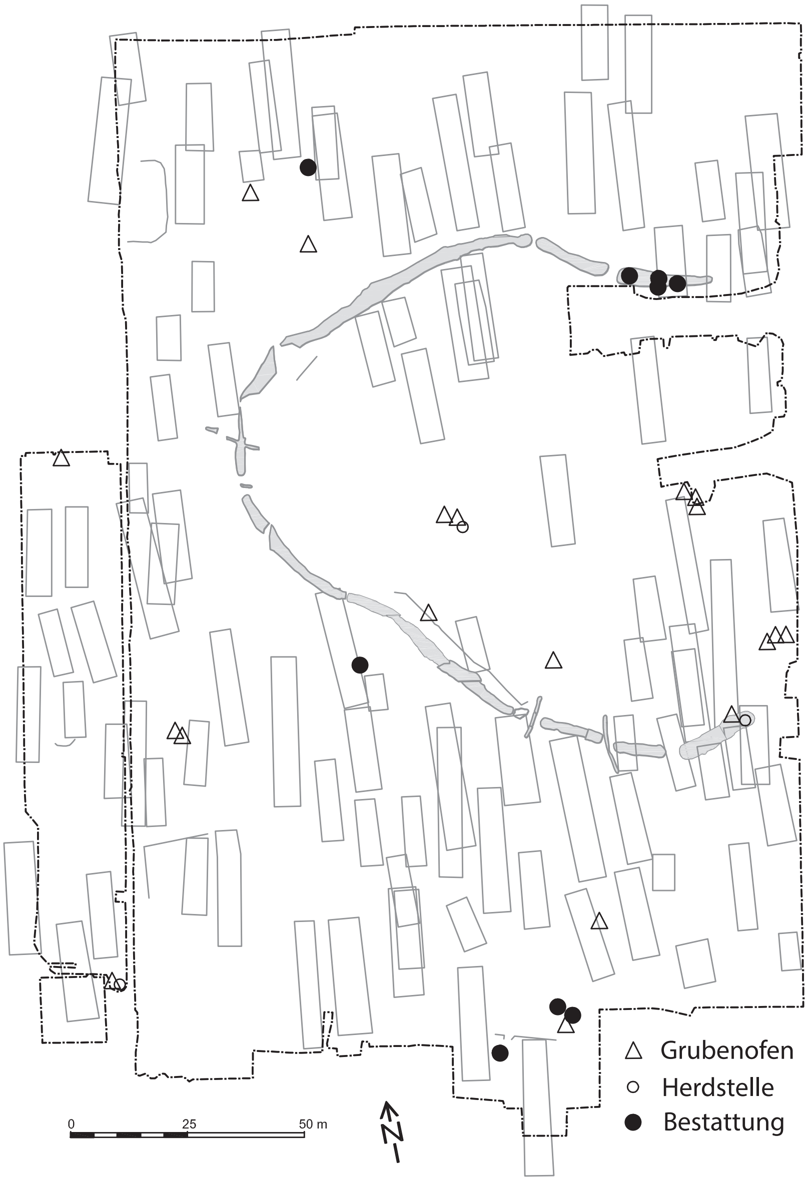

Fig. 4.5 The distribution of below-ground ovens at Stephansposching. After Pechtl (2009b, Abb. 107).

diet, and helped to define the appropriate contexts for consumption to take place, whether that was for individual bodies, households, or at settlements.

Common Difference

Diversity in LBK diet, like many other classes of evidence, is demonstrable at variable scales. It is important to note that the evidence does not suggest clear-cut identity classes based on distinct subsistence activities. Simplistic divisions between "farmer" and "hunter-gatherer" subsistence modes (as criticized by Garcia-Rovira 2013; Robb and Miracle 2007) are not repeated in the evidence from diet across the LBK (Bickle *et al*. 2011; Hedges *et al*. 2013). Rather, individual lifeways figured in diverse experiences of food and consumption—arising from the context of people's lives, as much in terms of biological processes as the social organization of diet. Sexed-based differences in the stable isotopes suggest that men and women largely shared a similar diet, except in the *Notenkopf* regions of Lower Austria, Moravia, and western Slovakia, where the male diet consistently appears to have included more animal protein (Hedges *et al*. 2013). Contrastingly, this region has relatively low rates of variation in burial form (grave orientation and body position) compared to other LBK regions (Hedges *et al*. 2013, 377); diversity in one sphere of practice need not have translated into others, or meant the same everywhere in the LBK. However, in contrast, household and communal consumption may have been widely shared, for example at feasting events (Marciniak 2005; Pechtl 2008), though some other variations have been noted above. Overall, the picture that develops from the isotopic data is one of widespread similarity and difference. The concept of *common difference* is adopted here, qualifying Modderman's (1988) notion of "diversity in uniformity"; therefore, rather than diet being completely uniform or intemperately diverse, foodways were uniform enough to allow diversity to persist, to intersect with the organization of bodies, households, and other social relationships, and to be a meaningful avenue for the negotiation of value.

While it may seem self-evident that diet was shared (that is, that people ate the same food and together), it is important to note that analysis of subsistence practices can suggest otherwise, at both a settlement (Bogaard 2004; Hachem 2011; Hachem and Hamon 2014) and a regional scale (Arbogast *et al*. 2001; Bogaard 2004; Döhle 1993; Knipper 2011; Kreuz 1990; Lüning 2000; Manning *et al*. 2013a; 2013b). The inter-relationship between subsistence, diet, and individual lifeways therefore warrants further investigation. Analysis of dental calculus (e.g. Warinner *et al.* 2014) and activity-related morphology (e.g. Villotte and Knüsel 2013) appear promising avenues for future research, as well as more frequent and focused consideration of the contexts in which food was prepared and consumed. There is more to be said about pottery as a container and means of consumption of food—open bowls may have been used more frequently during the Earlier LBK, while *Kümpfe* became more numerous at later sites (e.g. compare the pottery assemblages from Neckenmarkt and Strögen; Lenneis and Lüning 2001), perhaps suggesting distinct changes in the ways food was prepared, stored, and displayed. For example, Siemoneit (1997, 37) discussed a form of pottery vessel—which had holes placed beneath the rim, perhaps to teach children how to use the vessel—as smaller versions of larger vessels, suggesting that learning to drink liquids from pottery vessels (i.e. to adopt particular styles of holding and manipulating pottery) may have been an important aspect of consumption. Food is both a deeply personal, bodily experience and a communal activity. Diet thus offers a sphere in which different scales of practice intersect, from individual to culture-wide, and is a site where biology, environment, and social organization meet (Saul *et al.* 2014). As such, foodways deserve a more prominent role—or at least as prominent a role as subsistence—in our narratives of Neolithic life.

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Notes

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[1] In the *Hofplatz* model, settlements are formed of individual houses, which are successively replaced every 20–30 years (Lüning 2005).

[2] Excepting, of course, the contribution from stable isotope analysis, but models based on isotopic data again tend to focus on proportional contributions from plant and animal protein.

[3] Marciniak (2005) analysed the faunal assemblages from six sites in the Kuyavia region of central Poland (Bożejewice, Łojewo, Miechowice, Radojewice, Siniarzewo, and Żegotki).

[4] Arbogast (2014, 67) recorded approximately 20 incidences of "food offerings" in graves across the LBK.

[5] "C_3" refers to the type of plants found in temperate Europe; they are distinguished from C_4 plants by how they fix CO_2 from the atmosphere (Hamilton *et al*. 2013). While the LBK population would mostly only have had C_3 plants available to them, millet is C_4. The data therefore suggest that millet was largely absent or only played a minor role in LBK diet (Hedges *et al*. 2013).

[6] Fish may also figure in the LBK diet, but the stable isotopic data show little evidence of this (e.g. Hedges *et al*. 2013, 365).

[7] Lipid analysis currently allows for the distinction between non-ruminant adipose fat, ruminant adipose fat, and ruminant dairy fat. For further discussion of the methodology, see Salque *et al*. (2012).

[8] Led by Prof. R.P. Evershed, an ERC-funded project, *NeoMilk: The milking revolution in temperate Neolithic Europe* (2013–2018), will analyse a further 5000 sherds from across the LBK distribution.

MATERIAL CULTURE

CHAPTER FIVE

FLINT, OBSIDIAN, AND RADIOLARITE IN LITHIC INVENTORIES OF THE LBK CULTURE IN LESSER POLAND

JAROSŁAW WILCZYŃSKI

Introduction

The Lesser Poland voivodeship is a province in south-eastern Poland in the upper and middle reaches of the Vistula and in the upper reaches of the Warta. In this region, many Linear Pottery culture (Linearbandkeramik, LBK) settlements of different types and sizes are known (Fig. 5.1). The most notable of these are the settlements at Olszanica and Kraków Mogiła, the cave sites of Ciemna and Maszycka, and the more recently excavated settlements at Modlnica 5, Brzezie 17, and Targowisko 11 (Czekaj-Zastawny and Zastawny 2005; Kaczanowska and Kozłowski 1971; Milisauskas 1976; Wąs 2010). Generally, LBK occupation in Lesser Poland is datable to around 5600–4700 cal BC (Czekaj-Zastawny 2008, 116) and falls into three main chronological phases:

- Phase I (Gniechowice and Zofipole styles): a small number of sites dating to around 5600–5400 cal BC,
- Phase II (classical Music Note, *Notenkopfkeramik* phase): numerous sites dating to around 5400–5000 cal BC,
- Phase III (Želiezovce phase): late phase dating to around 5000–4700 cal BC.

Until recently—except for the site at Olszanica—LBK lithic materials were known mainly from settlements excavated only in part and from rescue fieldwork carried out near Kraków at the time of the construction of the Nowa Huta steel mill and industrial town in the 1950s and 1960s. Lithic assemblages from the Nowa Huta salvage excavation—carried out under even more pressure because of the propaganda attached to this flagship

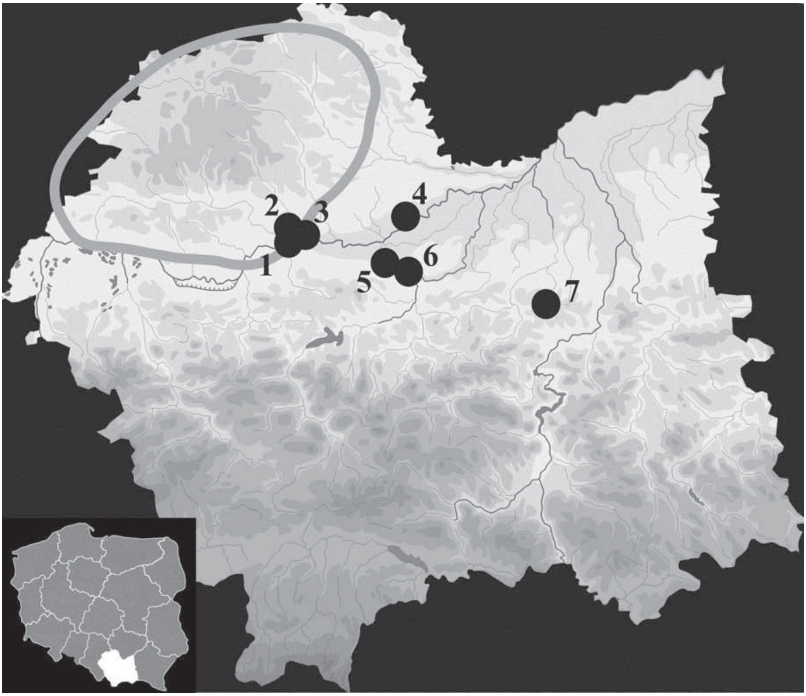

Fig. 5.1 Location of the LBK sites mentioned in the text. Grey oval: outcrops of Jurassic flint. 1 Kraków–Olszanica, Modlnica 5; 2 Bolechowice–Zielona; 3 Kraków Nowa Huta Mogiła 62, Pleszów 17-20, Kraków Bieńczyce 12, 15; 4 Zofipole; 5 Brzezie 17, Zagórze 2; 6 Targowisko 11; 7 Łoniowa.

construction project—were modest and mostly lack a fuller analysis. This situation changed for the better with rescue excavations carried out in advance of the construction of the A4 motorway (2000–2009), which yielded a large number of LBK settlements with much more abundant lithic inventories (Wąs 2010; Wilczyński 2014a; 2014b). The study of this new material faces some serious challenges given the far from satisfactory status of research into LBK lithic finds from southern Poland, with only a small number of complete analyses, some of which provide no accurate quantitative data or information about lithic resources used. Furthermore, quite often the chronological attribution of the lithic inventory is problematic. This may be either because the inventory lacks chronologically diagnostic forms, or because the site has yielded evidence of two or even three LBK phases and the fill of a single feature contains pottery attributed to several different LBK styles. The best example of this situation is observed in features discovered in sector B1 at Olszanica (Milisauskas 1975, 162). With only general information about the whole lithic assemblage, we have no way of assessing its individual phases. This makes is very difficult to compare the obtained data, something that is necessary if we are to trace the lithic resource supply and distribution systems within LBK societies. Also, data on raw materials are quite scarce. This is especially apparent if we compare detailed data on the raw material and information about the general structure of the inventories from various LBK sites (Tab. 5.1 and 5.2). For some localities, such as Olszanica or Kraków–Nowa Huta Mogiła 62, we have only general information about the frequency of the artefacts or raw material—instead of detailed data, we find descriptions such as “a few”, “more” and so on. Yet, although the evidence on LBK lithic inventories from Lesser Poland is of uneven quality and does not always contain a sufficient amount of information, it is possible to outline the process of lithic raw material procurement and distribution over the development of the LBK in Lesser Poland.

Raw material

The raw material most abundant on LBK sites in Lesser Poland is Jurassic flint (Balcer 1983, 56). It may be distinguished into several types differing in colour, cortex, nodule shape and size (Kaczanowska and Kozłowski 1976). In LBK sites in southern Poland, the most dominant type of Jurassic flint is type A (Balcer 1983; Kozłowski 1970). It is brown in colour, has medium to large nodules, a thin cortex, and is of excellent quality. Outcrops of this type of Jurassic flint are located near Kraków, in the southern margin of the Kraków-Częstochowa Jura.

Other lithic resources are recorded only in very small quantities in LBK inventories known from Lesser Poland. They rarely exceed 5 % and tend to be represented only by a single piece. They include different flint types, such as erratic Cretaceous flint, Chocolate, Świeciechów, and Volhynian flints, as well as obsidian and radiolarite (Fig. 5.2). It is still unclear whether the Świeciechów and Chocolate flints were obtained from natural outcrops located along the middle course of the Vistula river (Annopol region) and in the Holy Cross Mountains (Góry Świetokrzyskie), or were extracted from secondary outcrops found in the Sandomierz Basin (Kozłowski 1960; Libera 2005, 158; Wilczyński 2010, 114). The latter is true of the Świeciechów flint artefacts recovered at Brzezie 17, but this is unclear for the other materials.

	Local raw material				**Extra-local(?) raw material**						**Extra-local raw material**						
	Jurassic flint		**Cretaceous erratic flint**		**Świeciechów flint (erratic?)**		**Chocolate flint**		**Radiolarite**		**Obsidian**		**Volhynian flint**		**Other, not counted**	**Total (without 'Other')**	
Sites	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**		**N**	**%**
	phase I (Gniechowice and Zofipole style)																
Kraków-Mogiła 62	193	-	-	-	-	-	-	-	-	-	-	-	-	-	-	193	100
Targowisko 11	215	98.1	1	0.5	-	-	-	-	3	1.4	-	-	-	-	52	219	100
Zagórze 2	204	100	-	-	-	-	-	-	-	-	-	-	-	-	-	204	100
Zofipole	30?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	100
	phase II (Music Note style)																
Zofipole	75	100	-	-	-	-	-	-	-	-	-	-	-	-	-	75	100
Kraków-Mogiła 62	Unkn.	95.2	-	-	Unkn.	0.6	Unkn.	0.8	-	-	Unkn.	3.4	-	-	-	Unkn.	100
Bolechowice-Zielona	2962	99.8	-		-		4	0.1	1		3	0.1	-	-	-	2970	100
Modlnica 5	9283	99.9	1	>0.1	-	-	1	>0.1	-	-	6	0.1	-	-	750	9291	100
Brzezie 17	3682	98.8	4	0.1	10	0.2	1	>0.1	-	-	39	0.9	2	>0.1	385	3738	100
	phase III (Želiezovce style)																
Kraków-Mogiła 62	Unkn.	98.4	-	-	-	-	-	-	Unkn.	1.6	-	-	-	-	-	Unkn.	100
Łoniowa - feature 19 and 23	11	73	-	-	-	-	3	20	-	-	1	7	-	-	-	15	100
	phase II/III (Music Note and Želiezovce style)																
Olszanica (Kozłowski)	1924	100	-	-	-	-	-	-	-	-	-	-	-	-	-	1924	100
Olszanica (Milisauskas pits)	14628	98.9			a few	>0,1	a few	>0.1	-	-	162	1.1	-	-	-	14790	100

Tab. 5.1 (left) Raw material composition of LBK inventories from Lesser Poland (data from Breitenfellner and Rook 1991; Kaczanowska and Kozłowski 1971; Kaczanowska *et al*. 1987; Kadrow and Okoński 2008; Kozłowski 1970; Kozłowski and Kulczycka 1961; Milisauskas 1986; Valde-Nowak 2009; Wąs 2010; Wilczyński 2014a; 2014b). Unkn. = unknown

Obsidian, radiolarite, and Cretaceous Volhynian flint are non-local resources present on LBK sites and brought in over larger distances; their presence would confirm long-distance exchange with LBK communities outside the region. The earliest evidence of extra-local material—individual blades and retouched tools—comes from the early phase of LBK settlement, and later on is represented by blanks and isolated cores (Kaczanowska 1976, 37; Kaczanowska and Lech 1977, 14; Kulczycka-Leciejewiczowa 1987). The obsidian recorded on LBK sites in Lesser Poland comes from the Zemplén Mountains near Viničky in eastern Slovakia (Kaminská 1991, 19–20); the location of the outcrops of radiolarite, which is documented on the same sites, is less clear. Broadly speaking it was sourced in the Pieniny Klippen Belt (80–200 km away) and in the Transdanubian Mountains (350 km away). Carpathian deposits of radiolarite are located on the northern margins of the Šariš Basin, western Slovakia, and in the Pieniny Mountains (Kaminská 1991, 18–20; Rydlewski 1989, 29). Deposits of Volhynian flint are located in western Ukraine. However, the attribution of the few specimens struck from this material to LBK inventories is suspect (Wilczyński 2014a, 501).

Tab. 5.2 (overleaf) General structure of LBK inventories from Lesser Poland (data from Breitenfellner and Rook 1991; Kaczanowska and Kozłowski 1971; Kaczanowska *et al*. 1987; Kadrow and Okoński 2008; Kozłowski 1970; Kozłowski and Kulczycka 1961; Milisauskas 1986; Valde-Nowak 2009; Wąs 2010; Wilczyński 2014a; 2014b).

	Cores		Flakes		Blades		Retouched tools		Others		Total	
Sites	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
phase I (Gniechowice and Zofipole style)												
Kraków-Mogiła 62	14	7.2	121	62.6	40	20.7	18	9.3	-	-	193	100
Targowisko 11	28	10.3	107	39.5	52	19.2	31	11.4	53	19.6	271	100
Zagórze 2	11	5.3	112	54.9	44	21.6	20	9.8	17	8.4	204	100
Zofipole	1		21?		3		1		4		30?	100
phase II (Music Note style)												
Bolechowice-Zielona	94	3.2	2238	75.,4	545	18.4	81	2.7	12	0.4	2970	100
Brzezie 17	144	3.5	1660	40.3	909	22	333	8.1	1077	26.1	4123	100
Kraków-Mogiła 62	26	4.5	330	57.5	144	24.9	75	13.1	-	-	575	100
Kraków-Nowa Huta Pleszów 17-20	30	5.1	337	57.6	178	30.4	40	6.8	-	-	585	100
Modlnica 5	529	5.3	7429	74	562	5.6	531	5.3	990	9.8	10041	100
Zofipole	1	1.3	59	78.7	14	18.7	2	2.6	1	-	75	100
phase III (Želiezovce style)												
Kraków-Nowa Huta Pleszów 17-20	2	2.6	36	46.8	13	17	26	33.8	-	-	77	100
Kraków Bieńczyce 12, 15	38	9.1	260	62.1	76	18.1	43	10.5	-	-		
Kraków-Mogiła 62	16	3.81	249	59.4	118	28.2	36	8.6	-	-	419	100
Kraków-Mogiła 55	25	15.3	69	42.,3	35	21.5	34	20.6	-	-	163	100
Łoniowa - feature 19 and 23	1	7	-	-	8	53	4	27	2	13	15	100
phase II/III (Music Note and Želiezovce style)												
Olszanica (Kozłowski)	132	6.9	1551	80.6	155	8.1	29	1.5	57	2.9	1924	100
Olszanica (Milisauskas pits)	669	4.5	11471	77.6	1876	12.7	771	5.2	-	-	14790	100

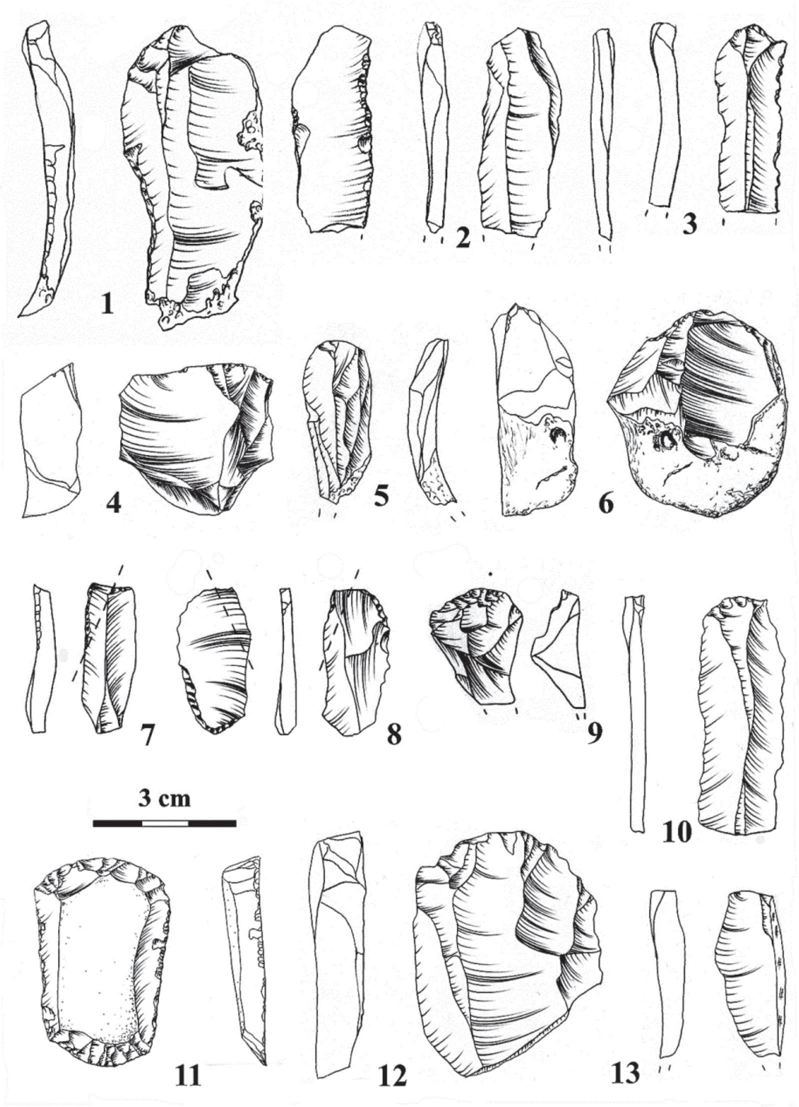

Fig. 5.2 LBK artefacts made on raw materials other than local Jurassic flint. 1–6, 10–13: Brzezie 17; 7–9: Targowisko 11. 1–6: obsidian; 7–9: radiolarite; 10, 11: Volhynian flint; 12, 13: Świeciechów erratic flint.

Phase I

This phase of LBK settlement in Lesser Poland is represented by only a small number of sites and a very modest number of analysed lithic assemblages (Kulczycka-Leciejewiczowa 1987; 309). Information exists for Zofipole, Kraków–Nowa Huta Mogiła 62, Zagórze 2, and Targowisko 11 (Kadrow and Okoński 2008; Kulczycka 1961, 20; Wilczyński 2014b), but assemblages from these localities rarely number over 200 artefacts (Tab. 5.1). During this early phase of LBK settlement only Jurassic flint was exploited, in individual cases accompanied by single artefacts struck from obsidian and radiolarite. Worth noting are three artefacts of red radiolarite—a truncated blade, a retouched blade with sickle gloss, and a flake—discovered at Targowisko 11 (Wilczyński 2014b, 461).

Lithic inventories of this phase include all the main groups: cores, blanks, and retouched tools (Tab. 5.2). Debris from flint reduction is also present, even on sites tens of kilometres away from the outcrops of Jurassic flint (Zagórze 2, Targowisko 11). This suggests that in terms of flint supply, Early LBK settlements were self-sufficient. There is no evidence of the emergence of "recipient" settlements to which flint was brought in the form of ready-made blanks. Long-distance exchange is confirmed by the presence of individual specimens made from non-local raw material.

Phase II (Music Note phase)

This phase is represented by a larger number of lithic assemblages recovered from sites around Kraków (Olszanica, Modlnica 5, Kraków–Nowa Huta Mogiła 62, Kraków–Nowa Huta Pleszów 17–20 (Kaczanowska *et al*. 1987; Milisauskas 1976; Wąs 2010)) and to the east of that city (namely Brzezie 17; Wilczyński 2014a). During phase II a significant increase in the number of lithic artefacts discovered on settlement sites is observable. They are mainly made from local Jurassic flint, but alongside them some pieces made from imported obsidian suggest long-distance trade (Tab. 5.1). In the Kraków region larger settlements (Olszanica, Modlnica 5) are established at this time. They were sited close to outcrops of Jurassic flint and played a major role in the distribution of this resource, as is evidenced by the presence of rich lithic inventories.

As in phase I, the general structure of inventories from phase II is characterized by a high ratio of flakes, which are much more frequent than blades and retouched tools (Tab. 5.2). This is especially visible at Zofipole, Bolechowice–Zielona, and Modlnica 5, where flakes account for more than 70 % of the inventories. A very high ratio of cortical artefacts can also be observed (Milisauskas 1986, 84), although an even higher ratio of these forms is observed on sites located about 40 km from flint outcrops, such as Brzezie 17 (Wilczyński 2014a, 503). Retouched tools are not numerous, only at Kraków–Mogiła 62 do they exceed 13 %. A characteristic of inventories from sites near Kraków is the presence of numerous flake tools, especially side scrapers, which are quite large in some cases (Kozłowski and Kulczycka 1961; Milisauskas 1976, 39). Presumably, this kind of tools can be linked to raw material extraction, and they are not present (or are found only as single specimens) on sites located at a greater distance from the flint outcrops.

Phase III (Želiezovce phase)

During this phase we observe continuity in the areas settled during phase II (Olszanica, Kraków–Nowa Huta Mogiła 62) and some expansion, especially in the area east of Kraków (Targowisko 12, 13, 14, Szarów 9, Zagórze 2), where a large number of LBK settlements have been identified. Unfortunately, many lithic inventories from these sites (including the largest ones) still await analysis or are in the process of being studied. During phase III, lithic inventories from Lesser Poland become more diversified and there is a higher share of Chocolate flint and obsidian (Tab. 5.1). This situation is observed even in the modest inventory from Łoniowa features 19 and 23, where the presence of Chocolate flint is noticeable.

During phase III, LBK sites in the region of Kraków can be seen to diversify, as documented by the structure of their lithic inventories. Some settlements emerge where flint processing was limited and the tools in use were manufactured either outside the living areas or produced from cores brought to the settlement from the outside (Kaczanowska *et al*. 1987, 110). Especially noticeable is the high proportion of cores and tools (20 %) in the inventory from Kraków–Nowa Huta Mogiła 55 (Tab. 5.2). Unfortunately, the above observations are made on the basis of finds from a modest number of smaller settlements and we do not know if this situation is also true of the larger settlements found to the east of Kraków.

Discussion

From the start, LBK settlement in Poland exhibits a well-developed system of raw material exploitation and distribution. It is characterized by the presence, at numerous sites, of Jurassic flint, which was exploited and exported across a large territory. Other raw materials, such as erratic flints (Cretaceous, Chocolate, and Świeciechów varieties), were never used on a large scale. This is a trait characteristic not only for the LBK, but also for other Neolithic cultures recorded in Lesser Poland, such as the Lengyel–Polgar cultural complex, the Malice culture, or the Funnel Beaker culture.

Artefacts made from Jurassic flint are noted in LBK inventories mainly from southern Poland, where they account for about 95 % of the whole assemblages. Jurassic flint is also recorded in larger quantities in Kuyavia, Lower Silesia, and Slovakia (Balcer 1983, 56; Domańska 1988, 87; Kabaciński 2010, 49; Kaczanowska 1976, 38; Wojciechowski 1981, 86), with single finds reported from Moravia, Bohemia, and Hungary (Biró 1998; Lech 1989; Mateiciucová 2008, 126). There is evidence from LBK sites of the full process of flint exploitation, from cortical nodules to finished retouched tools. This suggests that flint was worked and exported on a large scale, in some cases over a distance of up to 300 km. Unfortunately, we cannot link this activity to any recognized flint mines exploited by LBK communities (Lech 2006, 402). Presumably, flint was extracted close to the surface by digging shallow pits. This is also indicated by artefacts discovered at Kraków–Olszanica, which retain a characteristic black coating on their cortex, typical of raw material mined from deposits in eluvial clays (Lech 1987, 371). Alongside the high-quality Jurassic flint, type A, inferior types of Jurassic flint were also worked, collected from the valley of the Vistula and other rivers (Kaczanowska *et al*. 1987, 95).

Settlements may have been supplied with flint either by their inhabitants travelling to resource outcrops or through exchange. Although this question cannot be resolved conclusively using the archaeological evidence at hand, what is remarkable is the presence on the sites near Kraków of inventories which number several thousands of flints, suggesting the existence of flint extraction points in their vicinity. Settlements established close to outcrops of Jurassic flint can be interpreted as workshop settlements because of the presence of large numbers of artefacts (among which cortical flakes and other waste products dominate) and characteristic tool inventories (large numbers of side scrapers and retouched flakes; e.g. Modlnica 5, Olszanica). The specific character of such inventories hinders their attribution to the kind of settlement characterized by J. Lech (1981) as "flint mine workshops"—taking into account their role in the process of flint mining, production, and distribution of artefacts. On the one hand, some material could indicate that several settlements were consumers of flint artefacts—as indicated by their restricted inventory, long distance from material outcrops, as well as the presence of relatively numerous tools (Targowisko 11, Brzezie 17). Yet on the other hand, these inventories are characterized by features of a typical workshop near an extraction site, particularly a high amount of technical waste produced during the initial phase of core shaping. This situation probably resulted from the way in which lithic material was obtained, probably by the inhabitants travelling to the southern parts of the Kraków–Częstochowa Upland. It may be safe to conclude therefore that LBK communities, both those living close to the flint outcrops and those at a greater distance, made use of the same sourcing strategies. A closer analysis of sites in the region of Kraków–Nowa Huta has shown that the organization of the production system at some sites changed little throughout the development of the LBK culture (Kaczanowska *et al*. 1987, 110), but on the other hand there is evidence for emerging specialization of lithic production at some sites, particularly in phase III (Kaczanowska *et al*. 1987, 117).

Almost all LBK sites recorded in Lesser Poland have yielded obsidian artefacts, cores, blanks, and retouched tools. Obsidian finds are frequent in LBK assemblages, especially in later phases. This is well illustrated by the material from Kraków Nowa Huta–Mogiła, where the number of obsidian artefacts gradually increases (Godłowska 1976, 89–92): at that site obsidian finds are not recorded in inventories from the early phase (phase I), are sporadic during phase II, and become fairly frequent during phase III. The same situation is observed at Olszanica, where the percentage of obsidian artefacts increased steadily over time (Milisauskas 1986, 149). The presence of obsidian supports the hypothesis concerning the existence of trade, or some other form of inter-regional exchange among LBK communities. This idea can also be confirmed by finds of imported pottery from Slovakia, and even Hungary, on Polish LBK sites (Godłowska *et al*. 1987, 141; Kaczanowska 1976, 37; Kozłowski 1970, 89; Milisauskas 1976, 28). Most often these lithics are single finds, as at Komarnice, Łoniowa, Modlnica 5, and Bolechowice–Zielona (Aksamit 1971; Breitenfellner and Rook 1991, 13; Valde-Nowak 2009, 19; Wąs 2010), but obsidian was carried as far as the Polish Lowland, as is documented by artefacts from Zagajewka 1, Chabsko 40, and Kowalewek 14 (Kabaciński 2010, 104). More than 200 obsidian finds were discovered at the LBK settlement at Olszanica (Milisauskas 1976, 46). In some obsidian inventories we observed a high ratio of cores, but this tendency is probably the result of rescue excavations where systematic sieving of sediments was not carried out. Consequently, on such sites small artefacts are under-represented (especially bladelets). This is confirmed by fieldwork carried out at Olszanica, where obsidian cores make up 3.3 %, comparable to the percentage of cores in the flint assemblage (Milisauskas 1986, 148).

The presence of radiolarite on LBK sites in southern Poland is rare. This raw material was recorded only at Targowisko 11 and Bolechowice–Zielona (Breitenfellner and Rook 1991, 13; Wilczyński 2014b, 461), but it is also present in the Rzeszów region (Kozłowski 1970, 78). Because it is difficult to determine the origin of radiolarite, it is impossible to speculate where these artefacts came from. Erratic flints would have been collected during episodes of mobility connected with trade or the exploration of the area around the settlement, but such erratics were never exploited on a larger scale. The almost complete absence of Chocolate flint in LBK inventories from the territory of Lesser Poland is very noticeable, although this material is frequently recorded on sites in north-west Poland (e.g. Kuyavia and Greater Poland) (Balcer 1983, 58; Kabaciński 2010, 47; Małecka-Kukawka 1992, 94). It can therefore be concluded that two different centres of raw material exploitation existed in the LBK: one in Lesser Poland, relying on Jurassic flint being exported across the southern reaches of the LBK territory, and the other in the Holy Cross (Świętokrzyskie) Mountains, relying on Chocolate flint being exported to the north. The number of artefacts struck from Chocolate flint in LBK inventories from Lesser Poland only increases during phase II. This tendency is also observed for later Neolithic cultures in the area, for instance the Lengyel–Polgar cultures and the Malice culture.

Conclusion

Although lithic artefacts discovered within LBK assemblages from Poland are in many ways similar to each other, we can recognize some differences both in the raw materials used and in the technology and typology. Numerous localities concentrated around Kraków provided abundant assemblages, where local Jurassic flint dominates. At these sites, other raw materials such as obsidian, Chocolate flint, and Świeciechów flint are represented only as a small admixture. Similar to sites in Lesser Poland are assemblages that were discovered in the Sandomierz Upland; however, Świeciechów and Chocolate flint were frequently used, which is connected to the presence of outcrops of both raw materials in the vicinity (Kaczanowska and Lech 1977). The greatest variety of raw materials was identified in the eastern part of Lesser Poland (the Rzeszów region), where, due to the lack of local flint resources, it was necessary to import different kinds of lithic material such as obsidian, Jurassic, Świeciechów, and Volhynian flint from a long distance away (Balcer 1983, 78). Another situation can be observed on the Polish Plain, where local erratic Cretaceous flint was used for the production of retouched tools on a large scale. This resource is of poorer quality than for instance Jurassic flint, and was complemented by imports of Chocolate flint as well as Jurassic flint (Grygiel 2004, 383). The share of this raw material increased over time, reaching up to 60 % in Late LBK localities in some parts of the Polish Plain (Kabaciński 2010, 184). In contrast to the Polish Plain, in the area of Silesia, where similarly local erratic Cretaceous flint outcrops occur, Jurassic flint was imported in significant quantities (Wojciechowski 1988). On that basis, we can conclude that in an area rich in local, high quality raw material, for example Jurassic flint in the Kraków area, large specialized settlements were created which were engaged in the processing of the raw material and probably its distribution. The situation was different in areas bereft of rich raw material outcrops, where it was necessary to supplement the lithic resources, often importing them from an area several hundreds of kilometres away. The direction of such supplies should reflect the cultural influences between different LBK communities and, in that light, the differences observed among the imported flints of the Polish Plain and Silesia are very interesting.

Among LBK lithic assemblages from Poland, blade cores dominate, accompanied by numerous flake specimens (most are single-platform or with changed orientation). The only visible difference is the presence of the splintered technique, limited mainly to sites from Silesia and the Polish Plain, where erratic Cretaceous flint predominates. We can surmise that the use of the splintered technique was due to the quality of the erratic flint. It seems that the technique was connected with the maximal utilization of the available resource and with the limitations in the availability of good quality raw material. The lack of such types of artefacts from LBK sites in Lesser Poland or the Sandomierz Upland—even if they are located around 100 km from flint outcrops (e.g. the Rzeszów region)—may confirm such a supposition. On the other hand, we know of examples of erratic Cretaceous flint that are of good quality. However, it seems that the usefulness of raw materials for Early Neolithic communities was connected not only with the good quality of the resources, but also with their availability in significant quantities, which allowed communities to obtain considerable amounts of raw material with the least expenditure of time. Such a convergence can be observed in the case of Jurassic or Chocolate flint, but erratic flint is characterized by the significant dispersion of the raw material and this considerably impedes its efficient use. Such a situation led to the development of a settlement that concentrated on the exploitation of rich deposits of local raw material, whose products were then widely distributed.

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CHAPTER SIX

INTERPRETING FLINT WORKING DIVERSITY IN THE DUTCH LINEARBANDKERAMIK (LBK)

MARJORIE E. TH. DE GROOTH

Introduction

Within the framework of the research project "An Odyssey along the river Meuse. New perspectives on old Dutch LBK research (1925–2001)", funded through the Dutch NWO-Odyssey program, the flint assemblages of 11 partly excavated Bandkeramik sites could be studied. Seven of them were situated in the Graetheide region—and thus were close neighbours to classical Dutch Bandkeramik sites such as Elsloo–Koolweg and Geleen–Janskamperveld; the others were located on the Caberg, west of the river Meuse.

One of the Caberg Sites (Maastricht–Klinkers) contained material from both the Older (LBK I) and the Younger (LBK II) Bandkeramik, the other assemblages all belonged to the Younger LBK.

Whereas flints from extraction points in residual loams at Banholt predominated in the previously studied settlements at Elsloo–Koolweg and Geleen–Janskamperveld, an unexpected diversity of both local and regional flint types was worked at the settlements investigated in this study. Moreover, whilst the knapping style may form a real example of uniformity, instances of diversity were perceived in both procurement strategies and distribution mechanisms. Arguably, it would be too simplistic to explain this diversity merely in economic terms. The diversity in procurement and distribution strategies may in part be understood in terms of the settlement dynamics prevailing in the pioneer stage.

The diversification of raw material preferences in the Dutch sites occurred during a time of rapid increase in both the number and size of settlements. This expansion may well have been connected with disruptions in social cohesion. Thus, the changes may reflect a process of exclusion from traditional connections, of the establishment of new affiliations, and the need to express social identity in new ways.

Chronological context and dataset

According to the current state of research, settlers of the Linearbandkeramik culture (LBK) first reached the loess zone west of the Rhine early in the Flomborn period, as witnessed by the presence of decorated ceramics assignable to Modderman's (1970) phase Ib in a number of pioneer settlements. Such early settlements are not only known from the Aldenhovener Platte in the Rhineland (Zimmermann 2003) and the Graetheide in Limburg, but also from the Caberg on the west bank of the Meuse (Van de Velde 2011/2012). Three ^{14}C-dates on short-lived carbonised material provide a *terminus ante quem* for this first habitation. The first one, from Stein-Heidekampweg, reads 6340 ± 50 BP (GrA 53554), converting to a one sigma range of 5370–5290 or 5265–5230 cal BC (Van Wijk *et al*. 2012, 61). The two oldest dates from Geleen–Janskamperveld read 6260 ± 50 BP (GrA 27838) and 6240 ± 70 BP (GrA 27836), converting to a one sigma range of 5310–5205 and 5303–5076 cal BC respectively (Van de Velde 2007, tab. 14.6).

Tab. 6.1 The sites studied for the Odyssee project.

Site	**N flints**
GRAETHEIDE	
Beek-Stationsweg	26
Berg-Pastoor Eijckstraat	27
Geleen-Bergstraat	45
Geleen-Seipgensstraat	399
Geleen-Urmonderbaan	184
Stein-Steinderveld	127
Beek-Molensteeg (sample)	300
CABERG	
Maastricht-Klinkers '89-'90	4517
Maastricht-Belvédère '88	2617
Maastricht-Belvédère '25-'33	496
Maastricht-De Waal '25-'33	382

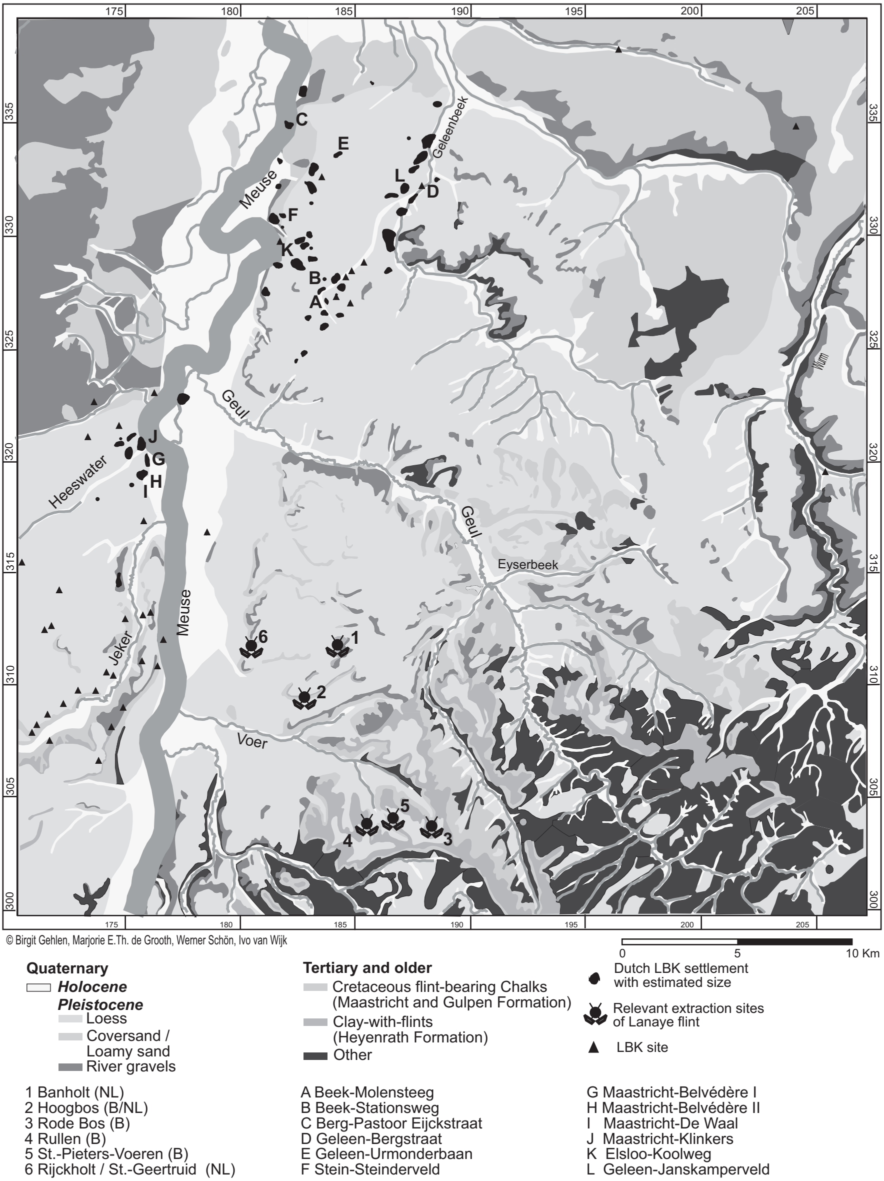

Fig. 6.1 Study area with relevant LBK settlements and flint extraction points, plotted on simplified geological map (adapted by I. van Wijk from De Grooth 2011, fig. 1).

This contribution is mainly based on an analysis of the lithic assemblages from 11 partly excavated Bandkeramik sites (Tab. 6.1 and Fig. 6.1), studied within the framework of the research project “An Odyssey along the river Meuse. New perspectives on old Dutch LBK research (1925–2001)”, which was funded through the Dutch NWO-Odyssey program (Amkreutz *et al*. 2012; Van Wijk *et al*. 2014). All but one of them date to the Younger LBK (from Modderman’s phase IIb onwards). The exception, Maastricht–Klinkers on the Caberg, started in phase LBK Ib and lasted until phase LBK IIc. The previously analysed complexes Geleen–Janskamperveld (LBK Ib–c), Elsloo–Koolweg (LBK Ib–IId), and Beek–Kerkeveld (LBK IIc–d) provided additional information (cf. De Grooth 1987; 2007).

Diversity in Uniformity

The system of flint working in the Linearbandkeramik of the Meuse–Rhine area offers a nice example of Modderman’s “diversity in uniformity” concept. This concept may be summarized in the following way:

> “In general discussions on the Linear Pottery Culture the emphasis has always correctly been on its uniform character. [...] A careful analysis of the earliest LPC traces in the regions shows that there were differences from the beginning. [...] The uniformity of the LPC is thus more likely to surprise the researcher than its regional differences” (Modderman 1988, 122–123).

Detailed analysis reveals diversity not only in raw material preferences, but also in procurement strategies and distribution mechanisms. For scholars sympathetic to Modderman’s original views the above statement may come as no great surprise. Yet, given subsequent studies in which an “almost pathological conventionality” is attributed to Bandkeramik communities (Keeley 1992, 82; cf. Louwe Kooijmans 1998, 423; Thomas 1996, 99), an elaboration is clearly called for.

Raw material preferences

The most important type of flint used by the LBK inhabitants of both the Graetheide and the Caberg clusters has its origin in the Lanaye Member of the Gulpen Formation, i.e. the lower part of the Late Cretaceous Maastrichtian (cf. De Grooth 2011; Felder and Bosch 2000). Archaeologists commonly call this flint type “Rijckholt flint” (e.g. Löhr *et al*. 1979; Zimmermann 1995), after the Middle Neolithic underground mining complex at Rijckholt–Sint Geertruid. Research on the Geleen–Janskamperveld assemblage (De Grooth 2007) made clear that the flints processed there possessed a number of characteristics not present in material from either the Rijckholt mining site or geological samples. As befits Lanaye flints, nodules are large (generally > 30 cm), their colour varies between very dark and very light grey, artificial surfaces are matt and fine-grained in texture, and a great many dark and light inclusions of varying sizes are present. The deviating traits consisted of, firstly, a reddish or brown zone that frequently is present under the cortex; alternatively, a thick white sub-cortical zone had developed. To this may be added the presence of yellowish streaks penetrating the flint matrix and a medium to high translucency. Such characteristics are also present in the material encountered at several extraction sites to the east and south of Rijckholt (De Grooth 2011; Felder 1998). Flints there were altered as a result of complicated karstic erosion processes. From the Pliocene onwards the limestone was eroded, leaving concentrations of flints embedded in residual loams (clay-with-flints). Owing to specific local conditions (e.g. presence of Oligocene sands rich in iron oxides), flints from these eluvial extraction sites show distinctive characteristics (De Warrimont and Groenendijk 1993), with Banholt displaying the best fit to Bandkeramik material (De Grooth 2007). Two nearby sites, Hoogbos and Rodebos, may have played a role as well, but at present their importance is difficult to assess.

Once identified at Geleen–Janskamperveld, in retrospect it became clear that this flint type also predominated at Beek–Kerkeveld (Fig. 6.2) and Elsloo–Koolweg. In the latter case, the importance of Banholt flint could recently be confirmed for assemblages from the 2006, 2012, and 2014 excavations (De Grooth in prep.). Consequently, the assessment of its general importance was a major research question during the Odyssey project (De Grooth 2014a). Unfortunately, the different subtypes of Lanaye flint mostly can only be recognized on artefacts with cortex (or other natural surfaces). Therefore, a large proportion of every assemblage may only be identified as Lanaye, but cannot be assigned to a specific context; whilst having been calculated, for the sake of clarity the percentages for these unspecified pieces are not shown in the following diagrams.

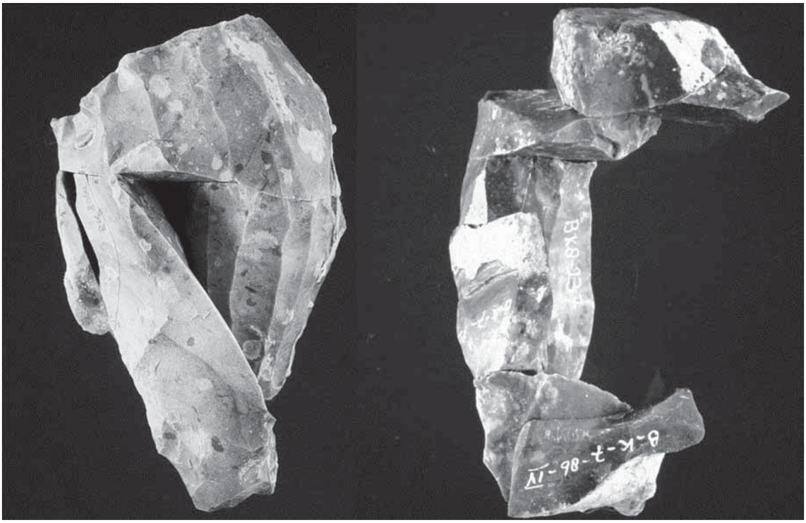

Fig. 6.2 Blade cores made of Banholt flint, with refitted preparation flakes and rejuvenation tablets, Beek-Kerkeveld (photo: Ger Hukkelhoven, Bonnefantenmuseum Maastricht). Length of left core: 15 cm; length of right core: 14 cm.

Site-based choices

The communal use of the Banholt flint source was initiated by the pioneer settlers of both the Graetheide (e.g. Geleen–Janskamperveld, Elsloo–Koolweg) and the Caberg (notably Maastricht–Klinkers). The finds from Elsloo house 103 and Maastricht–Klinkers feature 0.204, both dating to LBK Ib, may serve to illustrate its role (Fig. 6.3).

Given that transparent reddish-brown zones are said to be typical for the so-called “Rijckholt” flint encountered on the Aldenhovener Platte (e.g. Deutmann 1997; Löhr *et al.* 1979), it seems plausible that its earliest inhabitants were involved as well. Soon afterwards, such flints started to circulate in an exchange network which in its heyday linked settlements on an interregional and long-distance scale. Even at distances of some 200 km from the outcrop, they were still present in significant percentages (from 50 % upwards), and isolated finds circulated even further (Zimmermann 1995, 110–115).

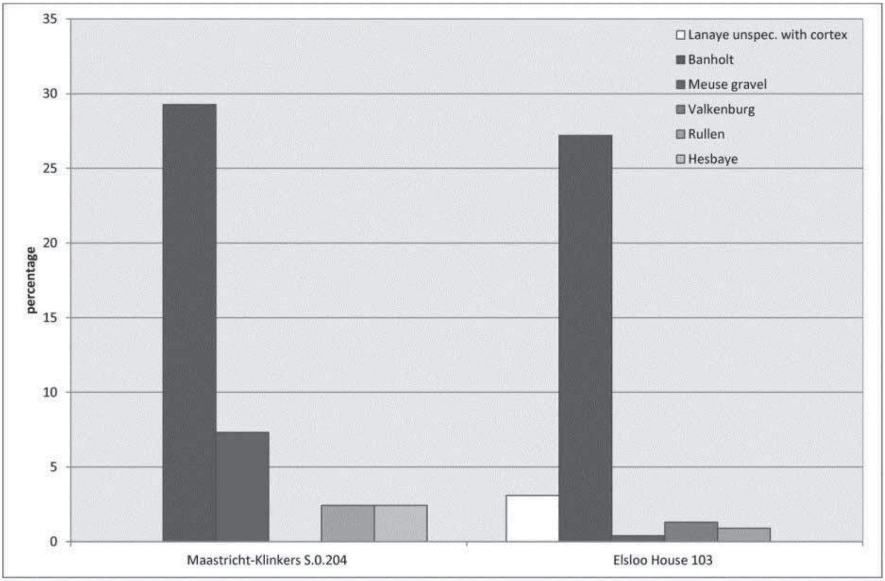

Fig. 6.3 Selected LBK Ib raw material assemblages (unspecified Lanaye flints without cortex not shown).

At Elsloo–Koolweg, flint of the Banholt variety remained the predominant type to the end of the settlement's existence (Fig. 6.4). However, although varying amounts of Banholt flint were still present in the LBK II assemblages studied for the Odyssey project, overall they displayed a remarkable diversity as regards the favoured flint type (a detailed discussion of these flint types can be found in De Grooth 2011). The flints labelled "Meuse gravel" could be collected almost anywhere in the vicinity of the settlements, in Pleistocene or Holocene deposits of the Meuse. "Valkenburg" flint, from the Emael and (to a lesser extent) Schiepersberg members (Late Maastrichtian, Maastricht Formation), also has a local origin. "Rullen" flints are another variety of Lanaye material altered through being embedded in residual loams; they were exploited at several extraction sites located to the south of Banholt. Finally, the Hesbaye flints (*Silex à grain fin de Hesbaye*, also known as *hellgrauer "Belgischer" Feuerstein* or "light-grey Belgian flints"), originate in a region some 30 km to the south and south-west of the Caberg. Maastricht–Klinkers offers the most striking example of this raw material diversity. In the 23 assemblages dating from phase IIa–c and containing at least 15 artefacts, raw material preferences vary from feature to feature (Fig. 6.5).

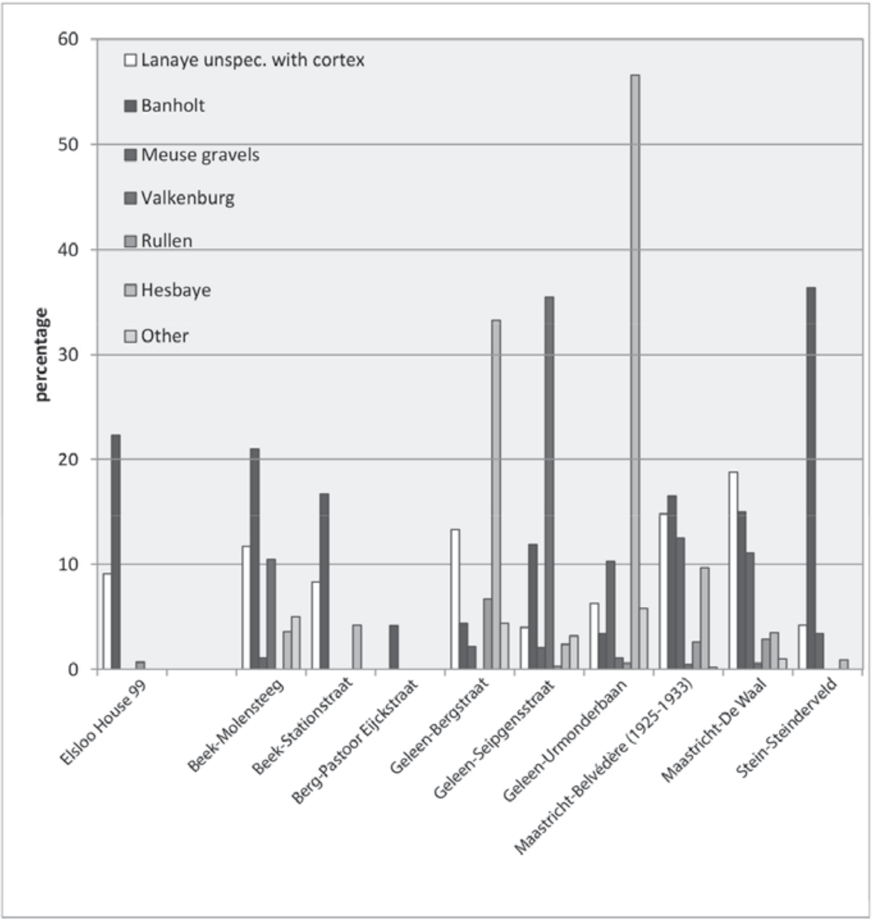

Fig. 6.4 Selected LBK II raw material assemblages (unspecified Lanaye flints without cortex not shown).

Two other Caberg sites, Maastricht–De Waal and Maastricht–Belvédère (excavated 1925–1933), display a comparable diversity as well, as do several of the project’s Graetheide sites (Fig. 6.4), and similar divergences are visible in the assemblages of other settlements. At Beek–Molensteeg, considerable amounts of Valkenburg flints occur alongside Banholt, as was the case at Geleen–Seipgensstraat. The same holds true for Beek–Kerkeveld and neighbouring sites, such as Kelmond–Beekerveld (Brounen and Rensink 2007; Pepels 2011) and Ulestraten–Beekerweg

(Pepels 2011). At Geleen–Urmonderbaan and Geleen–Bergstraat we find a predominance of Hesbaye flint, linked to relatively high proportions of Meuse gravel and Rullen material respectively. In this, they resemble sites such as Itteren–Sterkenberg and Nattenhoven–Bergerstraat (Amkreutz 2004), Smeermaas–Hocht (Klasberg 2010), Spaubeek–Looiwinkel (Brounen and Vromen 2005), Kelmond–Zonneveld (Pepels 2011), and even Weisweiler 29 on the Aldenhovener Platte (Krahn 2006). Ultimately, only four of the Odyssey complexes comply with the traditional pattern of Banholt predominance (Beek–Stationsweg, Berg–Pastoor Eijckstraat, and Stein–Steinderveld on the Graetheide and another site from the Belvédère quarry, excavated 1988; as for the latter site raw material was only recorded in a general way, it could not be included in Fig. 6.4).

Knapping style and toolkit

The knapping style practised from the pioneer phase onwards displays a high degree of uniformity (De Grooth 2008a; 2015; Strien 2000). Blades were detached from orthogonal cores using the punch technique. Shaping and maintenance of these cores consisted of increasingly careful preparation of one or more crests, rather perfunctory trimming of the core face (dorsal reduction), centripetal platform faceting, and the systematic, almost exuberant removal of whole series of rejuvenation tablets (Fig. 6.2). These procedures continued to be practised in various combinations in the Later LBK, not only in Germany and the Netherlands, but also in Belgium and France (Allard and Bostyn 2006).

The toolkit, too, shows many similarities and seems to be part of the package developed in the earliest stages of the Flomborn LBK (cf. Strien 2000). Notable regional exceptions are, on the one hand, the variety in arrowheads and, on the other hand, the creation of *quartiers d'orange* (Cahen *et al*. 1986) as a special tool type for performing the still not entirely identified task leading to the development of "gloss 23"—although the task itself was practised all over the Bandkeramik world (Van Gijn 2010; Van Gijn and Mazucco 2013, 118).

Procurement strategies and distribution mechanisms

At Beek–Kerkeveld, several refitted cores show that unworked nodules were brought into the settlement to be reduced on site (Fig. 6.2). The high proportions of unmodified flakes (upwards of 60 %) and of artefacts with cortex found elsewhere indicate that this practice was widespread. However, the presence of Bandkeramik blade cores and core rejuvenation

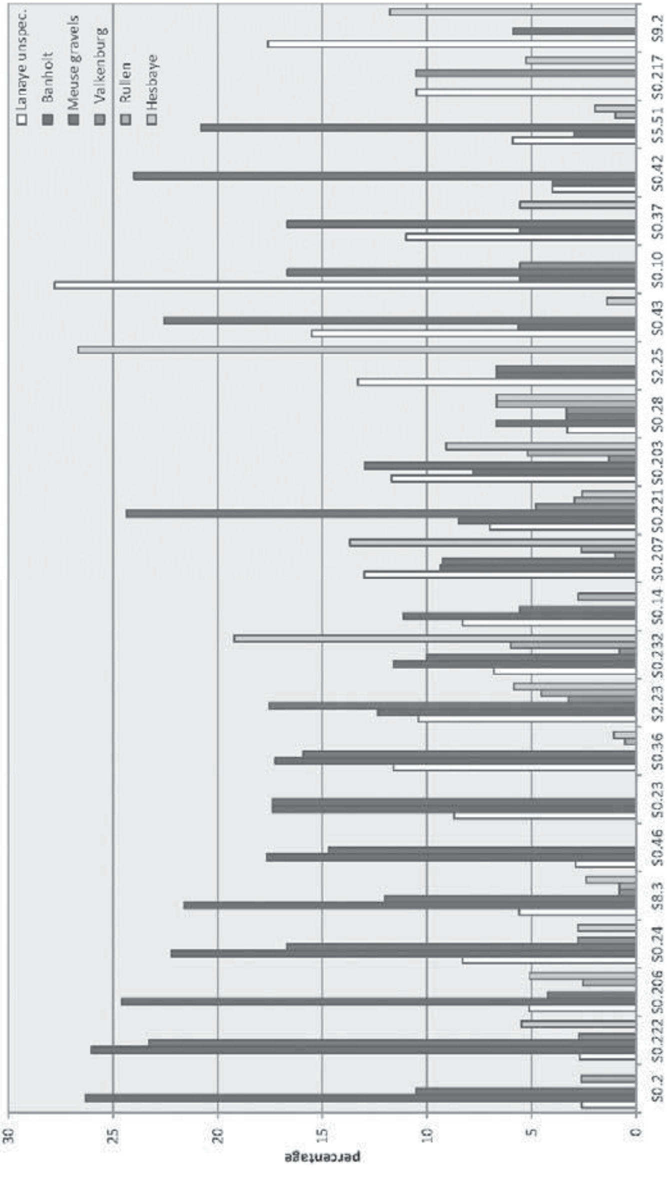

Fig. 6.5 Maastricht-Klinkers: raw material from LBK II features containing at least 15 artefacts (unspecified Lanaye flints without cortex not shown).

tablets at the Banholt extraction site indicates that other procurement strategies existed as well (Brounen and Peeters 2000/2001).

Moreover, detailed intra- and inter-site analyses revealed variability in flint working even among settlements sharing the Banholt flint source. The two wards (household clusters) recognized at Geleen–Janskamperveld differed significantly with regard to the intensity of flint working (De Grooth 2013a). Whereas similar amounts of blades and tools were present in the two wards, the south-western ward contained significantly more production waste. A similar dichotomy has been described for Erkelenz–Kückhoven (Nockemann 2008). In addition, in several settlement clusters in the Rhineland a hierarchical structure existed, in which pioneer settlements were more actively involved in acquisition and production and functioned as regional redistribution centres (Claßen 2009; Kegler-Graiewski and Zimmermann 2003). Arguably, in the earliest stages Langweiler 8 even may have received some prepared cores from Geleen–Janskamperveld and blades from Elsloo–Koolweg (De Grooth 2008b). Further afield, flints were often passed on between different regional groups, but social boundaries preventing contact have also been identified, and some settlements apparently were excluded from participation (Kerig 2010).

Discussion

Lithic assemblages can successfully be examined in socio-economic terms, focussing on aspects such as technology, procurement strategies, and exchange mechanisms, and applying models based on processual approaches. However, the interpretation of the results presented in the preceding paragraphs will also benefit from an analysis in which not only economic, utilitarian aspects are considered. Moreover, flint artefacts can be perceived as not only representing the products and consequences of human actions and ideas, but also as possessing symbolic value in their own right (cf. Appadurai 1986; Edmonds 1995; Pétrequin and Pétrequin 2002).

Firstly, the manifest and persistent uniformity of the knapping style may be interpreted in terms of Sommer’s (2001) approach, which “examines the scope for agency” in the LBK.

Whilst in the Younger LBK the choice of lithic raw materials was open to negotiation, the knapping procedure—newly established at the beginning of the Flomborn period—could have become a manifestation of stability, central to Bandkeramik identity and to group cohesion. With the exception of the arrowheads, this would hold true for the toolkit as well. A detailed discussion of the role assigned to arrowheads in the LBK, and in studies devoted to Mesolithic–Bandkeramik interactions, clearly lies beyond the scope of this article. De Grooth (2008a) and Robinson *et al*. (2010) offer recent summaries of the debate. It should be mentioned, however, that the arrowheads from Flomborn-period Geleen–Janskamperveld show a considerable variation (De Grooth 2008a, 222–225, tab. 19.1). Triangular points clearly predominate, and about half of these are symmetric, with left-winged and right-winged asymmetric points occurring in almost equal numbers. With each of these three types, flat ventral basal retouch (*retouche inverse plate*, cf. Jeunesse 2002) is present on less than 50 % of the cases. Moreover, as for other manufacturing details—such as the type of blank, the position of the tip on the blank, the intensity of retouch—seemingly anything goes. This holds true even for points discarded in the same refuse pit. A comparable lack of standardization is visible in the project's Younger LBK sites (De Grooth 2013b), at Elsloo (De Grooth in prep.), and at several settlements in the Hesbaye (Robinson *et al*. 2010). This diversity cannot easily be reconciled with the notion that Bandkeramik arrowheads were markers of cultural identity. Nor, for that matter, does it support the idea of a profound involvement of indigenous groups in shaping the western Bandkeramik world (cf. Heinen 2006).

The diversity in procurement and distribution strategies may in part be understood in terms of the settlement dynamics prevailing in the pioneer stage. Flomborn settlement in the Rhineland and the Graetheide shows major fluctuations with an alternation of expansion and consolidation (e.g. Münch 2009). Some of the pioneer settlements, such as Elsloo–Koolweg and Langweiler 8, flourished during the whole Bandkeramik period. Others, such as Geleen–Janskamperveld, were given up after only four generations. Although in this period of immense change people would be induced to cherish and maintain kinship ties, they could not depend on traditional, fixed exchange networks alone, but had to be flexible and opportunistic. Yesteryear's trusted exchange partner and his family today may have moved on, or may be bound by obligations to other relations. In such an unstable situation, differentiated procurement strategies were called for, even on a micro-regional scale.

Although, seemingly, no special value was attributed to Bandkeramik flint artefacts as such, in the course of their recurrent circulation they may have become endowed with special, symbolic meaning, and thus have been of social significance to both giving and receiving groups. Thus, they may have contributed to the reproduction of identity on a household or lineage level, and to maintaining kinship and ancestral relations.

Moreover, the distribution network was not unidirectional: for example, adzes made from central European rocks travelled to the west (Ramminger 2009).

During the LBK II period, the raw material assemblages differed from household to household, and from generation to generation. Arguably, it would be too simplistic to explain this diversity merely in terms of exhaustion of existing resources. After all, the refitted cores from Beek–Kerkeveld (Fig. 6.2) clearly indicate that Banholt flint was not treated as a scarce, valuable good. The divergence of raw material preferences in the project's LBK II sites occurred at a time of a rapid increase in both the number and the size of settlements, and lithic preferences link settlements, or rather households within settlements, on both sides of the river Meuse. These connections were small-scale, flexible, and short-lived. The diversification may well have been connected with disruptions in social cohesion and consequently the need to negotiate new identities. Some groups, notably the inhabitants of Elsloo, persisted in the tradition of an almost exclusive use of Banholt flint. Conceivably, they were still focussed on maintaining a good relationship with remote relatives in their homeland, and thus, ultimately, with their ancestors. Others were unwilling (or unable?) to adhere to this tradition—and thus started to do their own thing. Some experimented with alternative local resources, such as Meuse gravel material or Valkenburg flint. And some may have affiliated themselves with the inhabitants of the Hesbaye region. Incidentally, for the adzes a change in raw material is documented for this period as well: the "eastern" rock types amphibolite and basalt were abandoned in favour of "western" varieties, such as quartzite from Horion–Hozémont and phtanite from Céroux–Mousty, both originating from Belgium (Bakels 1987). Thus, the diversity in rock types, too, may reflect a process of exclusion from traditional connections, of the establishment of new affiliations and the need to express social identity in new ways.

The LBK groups discussed in this contribution shared many aspects of material culture, and the patterns of diversity outlined are of degree rather than of kind. Interpretation of these patterns benefitted from the application of models based on diverging theoretical approaches (cf. Van de Velde 1979, 79–120), thus illustrating another of Modderman's tenets:

> "Such models taken from ethnology, history, and experimental archaeology, are, with all their relativity, indispensable when making reconstructions. To a high degree, models determine the face of history that each generation writes anew" (Modderman 1988, 66).

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CHAPTER SEVEN

THE END OF DIVERSITY? POTTERY TECHNOLOGY AT THE LBK–BLICQUY/VILLENEUVE-SAINT-GERMAIN TRANSITION IN HESBAYE, BELGIUM

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LAURENCE BURNEZ-LANOTTE,
LOUISE GOMART
AND ALEXANDRE LIVINGSTONE SMITH

Introduction

The end of the Early Neolithic in north-western Europe is known as a time of progressive cultural fragmentation (Lichardus *et al.* 1985), leading around 5000/4900 BC to the splitting up of the LBK into different regional groups. In Belgium and northern France, this process of differentiation is attested by the onset of the Blicquy/Villeneuve Saint Germain[1] (here referred to as BQ/VSG) culture. According to the prevailing diachronic scenario, the BQ/VSG evolves out of the Final LBK (Bailloud 1983; Constantin 1985; 2013; Demarez *et al*. 1977; Ilett 2012), and most likely from the Recent and Late LBK of the Paris Basin (RRBP)[2]. Yet, we are far from consensus regarding the exact relationship between these two distinct but related Danubian cultures (Burnez-Lanotte *et al*. 2001; Cahen and Otte 1990; Constantin 1985; Constantin and Burnez-Lanotte 2008; Meunier 2012).

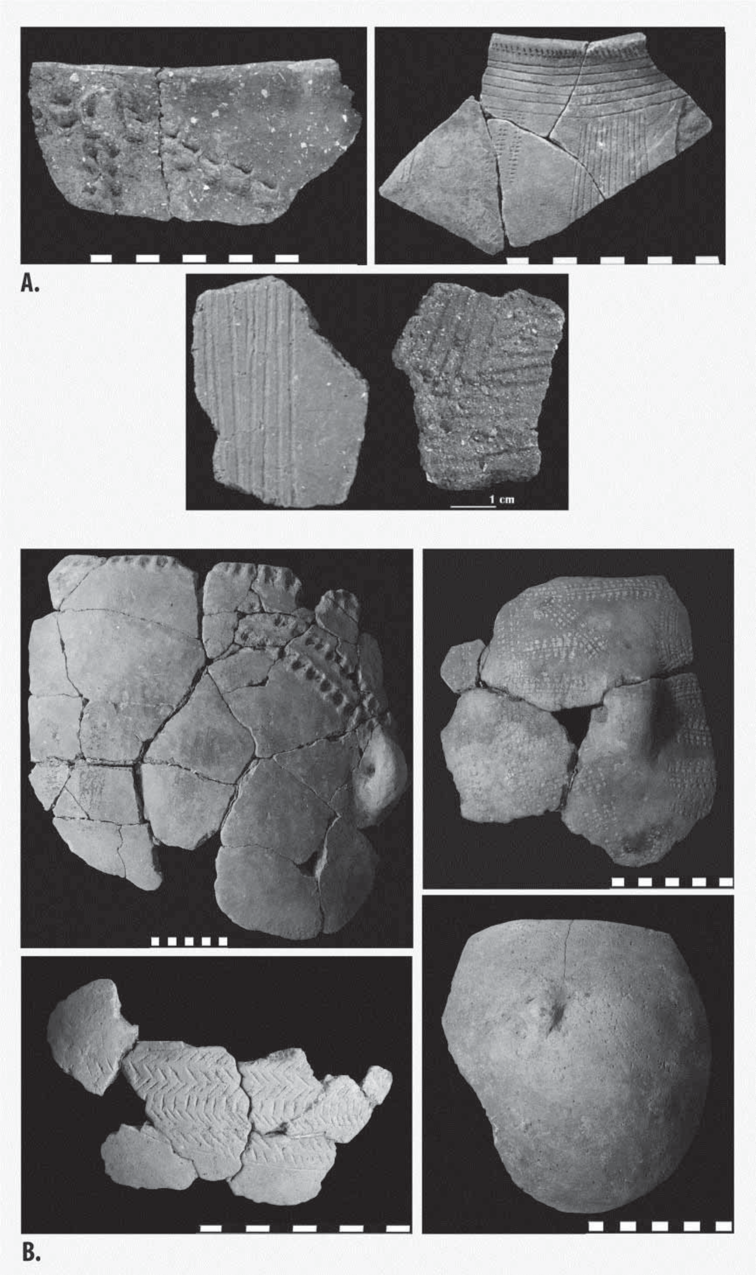
The stylistic variability of BQ/VSG pottery is particularly intriguing in this regard. This pottery exhibits well-established regional typological characteristics: large ovoid jars, sub-spherical bowls, pots, and bottles, which can bear small, horizontally perforated lugs or circular knobs and are decorated with specific spatula and multi-toothed comb impressions, V-shaped and garland motifs, as well as incised herringbone patterns.

Bone, shell, or calcareous tempers predominate. It differs from the standard LBK pottery of central Belgium in several aspects, but shares many common traits (Fig. 7.1) with the latest LBK pottery of the Paris Basin, as well as with Limburg pottery (Constantin 1985; 1994; Demarez *et al*. 1977; Ilett 2012). Southern influences, namely Cardial and Epicardial inputs, have also been invoked (Bailloud 1985; Constantin and Vachard 2004; Lichardus-Itten 1986; Manen et Mazurié de Keroualin 2003; Roussot-Larroque 1993).

BQ/VSG pottery thus appears as a kind of stylistic hybrid, a syncretic product integrating both "standard" LBK and non-LBK influences. In this regard, diversity—i.e. material heterogeneity more or less explicitly assumed to be the expression of social and/or cultural plurality (Jones 2005; Louwe Kooijmans 2010; Modderman 1988; Sommer 2001)—can be seen as inherent to its genesis. How exactly this diversity inherited from pre-existing Neolithic cultures contributes to the formation of this characteristic ceramic grouping, however, remains largely unknown (Constantin 1985; Farruggia *et al*. 1982; Meunier 2012).

Here, ceramic variability and diversity during the LBK–BQ/VSG transition will be discussed in terms of pottery technology, with a particular emphasis on fashioning techniques. This investigation is part of a broader research project aiming at a high-resolution technological analysis of the LBK and BQ/VSG ceramic assemblages from the site of Vaux-et-Borset (Belgium). The presented study focuses on the pottery recovered from the BQ/VSG settlement. BQ/VSG pottery technology is only poorly documented, with the exception of a few studies mostly concentrating on the analysis of ceramic raw materials (Constantin 1976; 1985; Constantin and Courtois 1985; Livingstone Smith and Jadin 1993; 2003; see also Gomart 2010 for a study of fashioning techniques). The characterization of this corpus thus appeared as a priority. This work is still ongoing[3] but shows promise, as suggested by our first results pertaining to fashioning techniques.

Fig. 7.1 (right) A: Fine and coarse LBK wares (first row) and Limburg pottery (second row) from Cuiry-lès-Chaudardes "Les Fontinettes" (Photo: S. Oboukhoff in Ilett and Constantin 2010); B: BQ/VSG sherds from Vaux-et-Borset "Gibour" and "A la Croix Marie-Jeanne" (Photo: B. Van Doosselaere).


A.
1 cm
B.

A focus on fashioning techniques

Anthropological and ethnoarchaeological research undertaken during the last few decades has shown the importance of reconstructing fashioning techniques as a tool for the study of social interaction networks and identities (Berg 2008a; 2008b; Gosselain 2000; Livingstone Smith 2001a; Mayor 2011; Pierret 2001; Roux 2011; 2013). The fashioning stage is therefore considered a key moment of the *chaîne opératoire*—defined as "a series of operations transforming a raw material into a finished product" (Creswell 1976, 13)—not only because it constitutes a major strategic task (Lemonnier 1992), but also because it involves a series of specialized gestures, objects, and representations which are believed to be deeply socially embedded.

Learning requirements related to the acquisition of craft skills have long been regarded as a main driver in the mechanisms underlying this social embeddedness (at least since Arnold's seminal 1979 work). Mastering a fashioning technique requires lengthy apprenticeship and close interaction between the apprentice and his/her master. Through this learning process, practical knowledge, movements and postures, tools, but also social norms, values, and symbols—or in other words "world views"—are conveyed, transmitted, and finally more or less consciously incorporated (see discussions in Dobres 2000; Gosselain 2002; Lemonnier 1992). To quote Roux (2013, 314): "the process itself of apprenticeship of craft skills creates a strong cognitive relationship between craft techniques and social identity, favouring the confinement of these techniques to the perimeter of the social group within which the craft is learned and transmitted". This could explain why fashioning techniques are extremely stable through space and time and why their distribution often coincides with major social and cultural boundaries (such as ethnolinguistic groups, socio-professional units, political factions, matrimonial networks, or gender communities), as opposed to ornamental or surface finishing practices, for example, which are more easily reproducible and hence volatile.

Though supported by substantial ethnographic and ethnoarchaeological research (Gosselain 2000; Livingstone Smith 2001a; Roux 2011), this basic postulate has recently been reconsidered and somewhat tempered. Far from being just a strict replication of motor habits acquired during apprenticeship, technical action in post-learning contexts is, in practice, constantly questioned and reassessed by the potters, depending on the production as well as consumption contexts with which they are associated, leading sometimes to deep and fast alterations at individual and/or community scales (for a discussion see Gosselain 2011). In central

Niger, for example, potters of Tuareg origin seeking upward social mobility have engaged in a transformation process by adopting a series of markers distinctive of the Hausa, a population associated with Muslim orthodoxy, urbanity, and wealth. Along with changes introduced in language, clothes, and architecture, potters shifted from the pounding technique, a fashioning technique that is considered typically Tuareg, to moulding, which is locally associated with a Hausa identity (Gosselain 2011). Another example comes from the eastern part of the middle Senegal valley. In this region, Tukulor potters, who are either established or distributing their products in Soninke settlement areas, recently stopped shaping their pots by drawing a lump and instead turned to moulding on a convex support—a technique that they learned and borrowed from their Soninke neighbours. Along with efficiency needs, imperatives of cultural integration are key factors in this technical evolution (Gelbert 2003).

In the above-mentioned examples, as in many other cases, technical shifts are never trivial and commonly take place in the wake of a redefinition of identity. Because shaping techniques tend to reflect deeply-rooted facets of identity, evidence of discontinuities or, conversely, continuities is thus always highly significant in terms of social and/or cultural dynamics. Through the detailed reconstruction of manufacturing processes, our aim is to explore these subtle and complex dynamics, which pottery, as a by-product, potentially materializes.

The site of Vaux-et-Borset

Vaux-et-Borset "Gibour–A La Croix Marie-Jeanne" is one of the rare sites in central Belgium that have yielded both LBK and BQ/VSG occupation traces. These paired sites are of fundamental importance for understanding the historical development of the Early Neolithic in Belgium and northern France. Ever since their discovery in the 1980s, they have been a matter of controversy concerning the chronological and cultural relationships between the LBK and the later BQ/VSG (Burnez-Lanotte *et al*. 2001).

The site of Vaux-et-Borset, located in Hesbaye, lies on the summit and the southern slopes of a loamy plateau. First discovered by J. Docquier (1993–1995), it was then excavated during the late 1980s and early 1990s (Burnez-Lanotte and Caspar 2005). A total surface of over 20,000 m^2 has been investigated. Since the series of available ^{14}C dates present too severe inconsistencies to provide a reliable temporal framework (Burnez-Lanotte *et al*. 2001; Constantin 2002), chronological attributions are primarily based on ceramic typology.

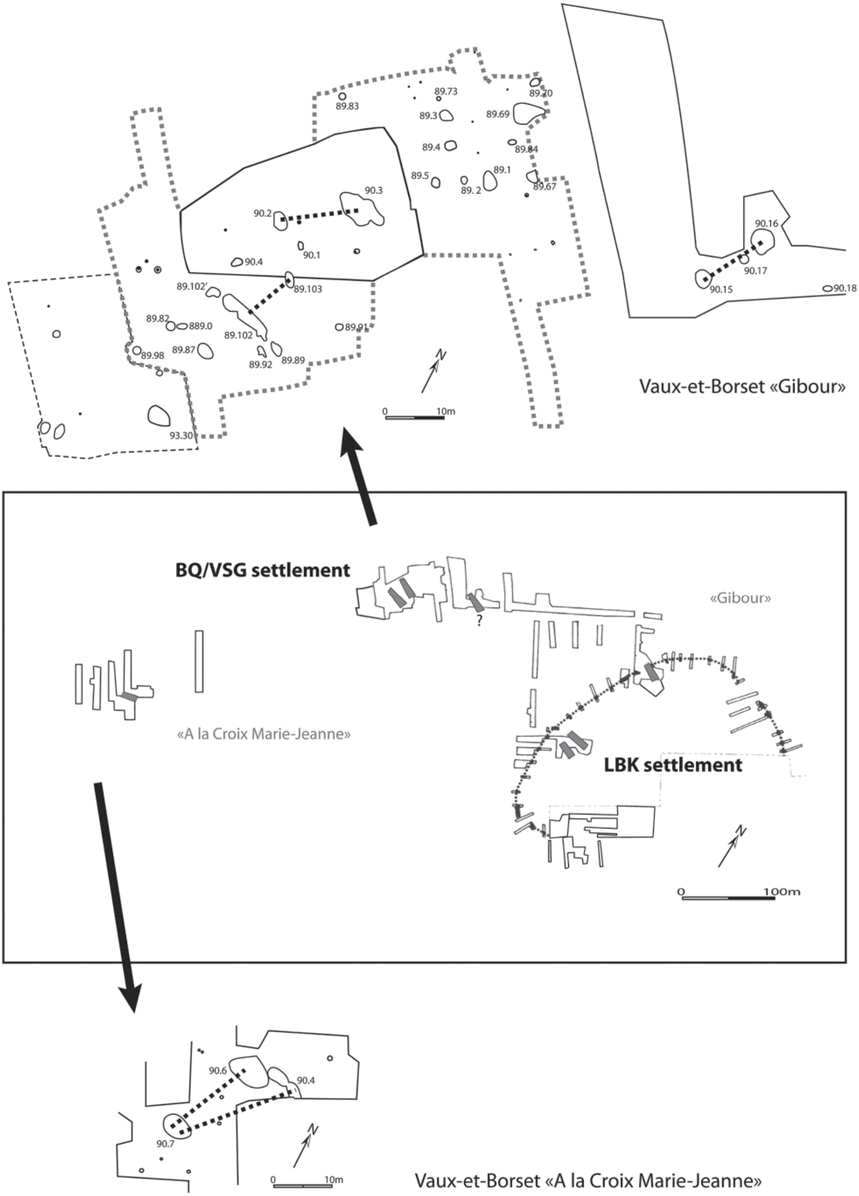


Fig. 7.2 Map of the Vaux-et-Borset site (CAD: S. Denis, after Burnez-Lanotte *et al*. 2001).

The LBK occupation (Fig. 7.2) is characterized by a series of spatially associated features (postholes, pits, ditch segments) which make up several distinct houses, surrounded by an interrupted circular enclosure. The detailed chronology of the LBK in Dutch Limburg offers the closest chronological reference for the site. We therefore refer to Modderman's (1970) sequence here. According to the seriation of ceramic decoration techniques, we can put forward the hypothesis that the LBK site was occupied during the periods IIc and IId.

The BQ/VSG settlement consists of two distinct zones comprising at least three domestic units. These putative houses have been identified from the presence/absence of postholes, orientation of the spatially associated pits, and refitting evidence (Fig. 7.2). Current evidence argues in favour of a chronological attribution to stages II and III of the local BQ/VSG sequence established by Constantin (Hauzeur and Constantin 1993) and stages II, III, and IV of Hauzeur's (2008) sequence.

The BQ/VSG ceramic assemblage of Vaux-et-Borset

The site yielded an abundant and relatively well-preserved material. Most of the ceramic finds come from the pits surrounding two of the three possible domestic units. Here, we will only give a brief description of the main morphological and ornamental characteristics of the BQ/VSG ceramic assemblage of Vaux-et-Borset, which has already been published and thoroughly described by Hauzeur and Constantin (1993).

A total of 556 individual vessels have been recognized in the ceramic assemblage. Their morphology is varied but six distinct classes were defined (see Fig. 7.8): large storage jars with vertical, diverging or slightly converging walls (1), subspherical pots with everted rims (2), bottles with narrow necks (3), simple closed pots (4), simple open bowls (5), and various forms of miniature pots (6) (Constantin 1985; Hauzeur and Constantin 1993).

Decorated pots represent 44 % of the total corpus. Rim decoration mainly consists of one or two series of spatula, finger, or multi-toothed comb impressions, small dot-like applied knobs, or a combination of both. Particularly varied, body decoration consists of modelled or incised V-shaped and garland motifs, impressed or incised vertical, oblique, or curved patterns, along with applied lugs or knobs. Incised or impressed herringbone patterns, which are distinctive of Blicquy pottery (as well as of Limburg pottery), are equally frequent.

Data relating to pottery technology are scarce and mostly concern the raw material processing stage. Bone has been identified macroscopically as a predominant tempering material, which is also a distinctive characteristic of the Blicquy group (and of Limburg pottery). Grog, sometimes appearing alongside bone, seems to be less frequent. Hauzeur and Constantin (1993, 69) also mention the presence, in a few samples, of a porosity of possible organic origin. Notably, though anecdotic, poppy has been identified as a likely tempering agent in one sample of the BQ/VSG assemblage (Bakels *et al.* 1992). The subsequent stages of the *chaîne opératoire*, including the fashioning stage, have not been studied in detail. As suggested by fracture and join patterns, fashioning techniques seem to be dominated by coiling. Our macroscopic and radiographic investigations enabled us to be more precise and reveal that the fashioning techniques observed at Vaux-et-Borset are far more complex and diverse than suggested by such a generic description.

Material and methods

All the 556 individuals from the BQ/VSG ceramic assemblage were preliminarily examined. The most complete vessels, selected in order to provide a representative set of most typological and ornamental categories, along with a few additional body and/or base fragments showing discrete technical features, were then sampled (n=268) for further macroscopic and radiographic investigations.

All the 268 samples were macroscopically examined. Macroscopic examinations were conducted under low-angle light, thereby guaranteeing good conditions of observation. In addition, 30 samples were macroscopically examined in a blind test.

A subset of nearly 70 samples was then subjected to radiographic examinations. X-ray images were obtained by means of direct digital radiography, using a flat panel (Carestream DRX-1) with a 60 cm focus-to-film distance and at 40–45 kv; 1.3–6 mAs.

Our analysis relies on the methodology developed by Livingstone Smith, which has already been successfully applied to ethnographic collections and widely used for archaeological case studies (Bosquet *et al.* 2005; Gomart 2014; Livingstone Smith 2001b; Livingstone Smith and Visseyrias 2010; Van Doosselaere 2005; 2014). One of the chief advantages of this approach is its descriptive system, which distinguishes various kinds of features and configurations, thereby allowing a precise and detailed technical characterization.

Three kinds of features have been recorded:

- Macroscopic surface features, or *macrotraces*, as observed on the inner and outer surfaces of the vessels. These macroscopic features include topographic and textural variations, as well as fracture patterns.

- Internal macroscopic features, or *macrostructures*, corresponding to the preferential orientations of the basic clay mass, porosity, and non-plastic inclusions, viewed macroscopically along radial (vertical) cross-sections.
- Internal radiographic features, or *radiostructures,* as observed in tangential (frontal) or basal view. Two kinds of internal radiographic features are distinguished here: density variations (areas of hypo- or hyperdensities) and preferential orientations of porosity and non-plastic inclusions (dark and bright discrete elements, respectively).

The distribution of these various features and their combination, which are termed configurations (Livingstone Smith 2001; Livingstone Smith and Visseyrias 2010), are interpreted in terms of technical behaviours through comparisons with reference data available in the literature and with our own experimental reference database (for a synthesis of available data, see e.g. Berg 2008a; Livingstone Smith 2001; Pierret 2001; Rye 1981; Van Doosselaere 2014). Primary and secondary forming steps have been taken into consideration. Primary forming (or roughing-out) is defined as the starting process of the fashioning stage, during which the potter builds the rough-out, usually a cylinder or a cone. Secondary forming (or preforming), leading to the making of a preform, corresponds to more superficial actions aimed at attributing to the pot its definite morphological characteristics (Gosselain 2002; Rye 1981). Operations related to the shaping of the rough-out or the preform may be freely combined successively or simultaneously. Following Roux (2011), the specific fashioning process, articulating these two technical steps, is here called a method.

Results

Shared features

The studied material is characterized by a series of recurrent features pertaining to both the primary (a) and the secondary (b) forming steps.

a) Upper parts of the vessels are systematically characterized by a latitudinal configuration, which is particularly well visible on radiographic images (Fig. 7.3 A). The radiographs show a succession of latitudinal hyperdense zones (bright areas) and hypodense zones (dark areas), locally underlined by patterns formed by the preferential orientation of porosity and non-plastic inclusions (appearing on the radiographs as dark and bright discrete elements, respectively). These radiostructures are generally associated with macrotraces that appear on the external and/or internal surfaces of the vessels in the form of more or less continuous long reliefs, sometimes disrupted by subcircular depressions and fine, irregular grooves. Latitudinal and/or rectangular fractures are also present. As already demonstrated by several authors (Berg 2008a; Livingstone Smith 2001a; Rye 1981), this kind of configuration is characteristic of adding coils during primary forming.

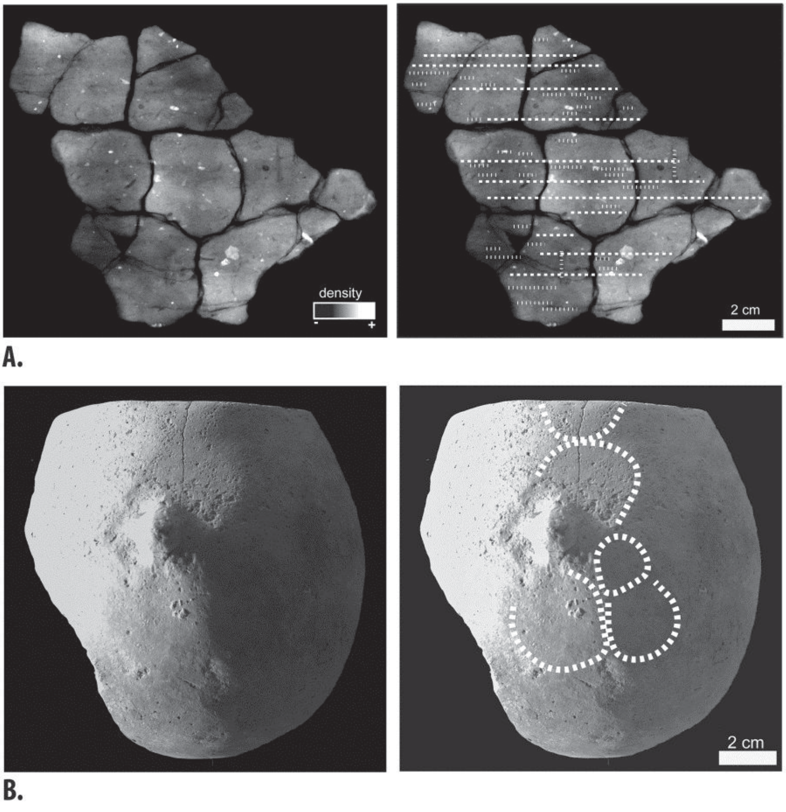


Fig. 7.3 A: Radiography (frontal view) of a body sherd (VBT 89.102.49) revealing the presence of coils (dashed lines: preferential orientations; bold dashed lines: density variations); B: Subcircular flattened areas on the body of the vessel (VCL 90.4.8) as a result of beating operations.

b) The presence of subcircular flattened areas on the outer surfaces of the vessels is also a recurrent observation (Fig. 7.3B). These topographic variations are frequently associated with shallow subcircular depressions on the inner surface. These marks are known to result from beating, a preforming technique generally used in order to regularize and/or to thin the walls of the vessels and shape their profile (Martineau 2005; Pierret 2001; Rye 1981; Van Doosselaere 2014).

Except for these shared trends, features observed on the upper and lower parts of the vessels are characterized by significant variations, allowing us to discriminate several fashioning methods. Amongst the 268 samples, a total of 171 individuals could be confidently associated with a particular fashioning method.

Fashioning methods

Most significant technical variations relate to the roughing-out step. These variations led us to recognize three distinct fashioning methods (Tab. 7.1).

Tab. 7.1 Frequency of morphological parts associated with each fashioning method (B: base; LB: lower body; UB: upper body or shoulder; M: mouth, i.e. rim or neck).

Morphological parts	Method 1	Method 2	Method 3	Undeter-mined	TOTAL
B	5			1	6
B+M	1				1
B, LB, UB			1		1
B, LB, UB, M	2	3	9		14
B, LB, M		1	1		2
UB				1	1
UB, M	19	9	1	15	44
M	26	19	1	57	103
LB	1	1	2	9	13
LB, UB	2			5	7
LB, UB	22	14	13	6	55
LB, M	8	10		3	21
TOTAL	86	57	28	97	268

Method 1:

A group of 86 samples is associated with method 1 (Tab. 7.1). Series of latitudinal features (density variations and preferential orientations) are clearly visible on X-ray images of several lower and upper body fragments (Fig. 7.4). Macrotraces (topographic variations of the inner and outer surfaces and fracture patterns) are also combined following a latitudinal configuration. As already mentioned, this kind of configuration is diagnostic of coil addition. Radiostructural characteristics of base fragments indicate that coiling was also performed to rough-out the lower parts of pots. Indeed, radiographic views of base fragments display an annular configuration, which, according to available ethnographic and experimental reference data (Livingstone Smith 2001; Rye 1981; Van Doosselaere 2014), could derive from a coil wound up in a spiral.

Macrostructures provide further information regarding this fashioning method. Viewed in section, the basic clay mass, porosity, and non-plastic inclusions are clearly organized in diagonal features. Notably, these diagonal features display a recurrent external orientation, forming a “Z” pattern. This “Z” pattern is known from various Neolithic contexts (Bosquet *et al*. 2005; Gomart 2014; Pétrequin *et al.* 2009; Raemaekers and De Roever 2010) and is usually interpreted as deriving from overlapping coils. Such features have been reproduced in experimental conditions in which pots were built by applying coils with an external overlap (Pétrequin *et al*. 2009; Visseyrias 2006). Livingstone Smith (2001a) also observed similar features on ethnographic ceramics collected in Togo that were shaped with externally overlapping and crushed rows of coils (Livingstone Smith 2001a). The diagonal features observed on the BQ/VSG material most likely derive from coils added and deformed in the same way. Marked external as well as internal pressures may have been applied to vessel walls, since traces of deformation, namely subcircular depressions and thin grooves, have been observed on both inner and outer surfaces. However, whether the pots were shaped from the bottom to the top, with externally overlapping coils, or conversely from the top to the bottom, with internally overlapping pieces, cannot be determined.

Method 2:

A group of 57 individuals exhibit distinct features that can be attributed to a second fashioning method (Tab. 7.1). Macrotraces (inner surface topography and fracture patterns) and radiostructures (density variations and preferential orientations), which are predominantly latitudinal, both in upper and lower parts of the pots, are comparable to the first method and suggest the use of coils. Annular configurations also characterize basal fragments viewed in the radiography and could, similarly, indicate the use of a wound coil to fashion the bottoms of the vessels (Fig. 7.5).

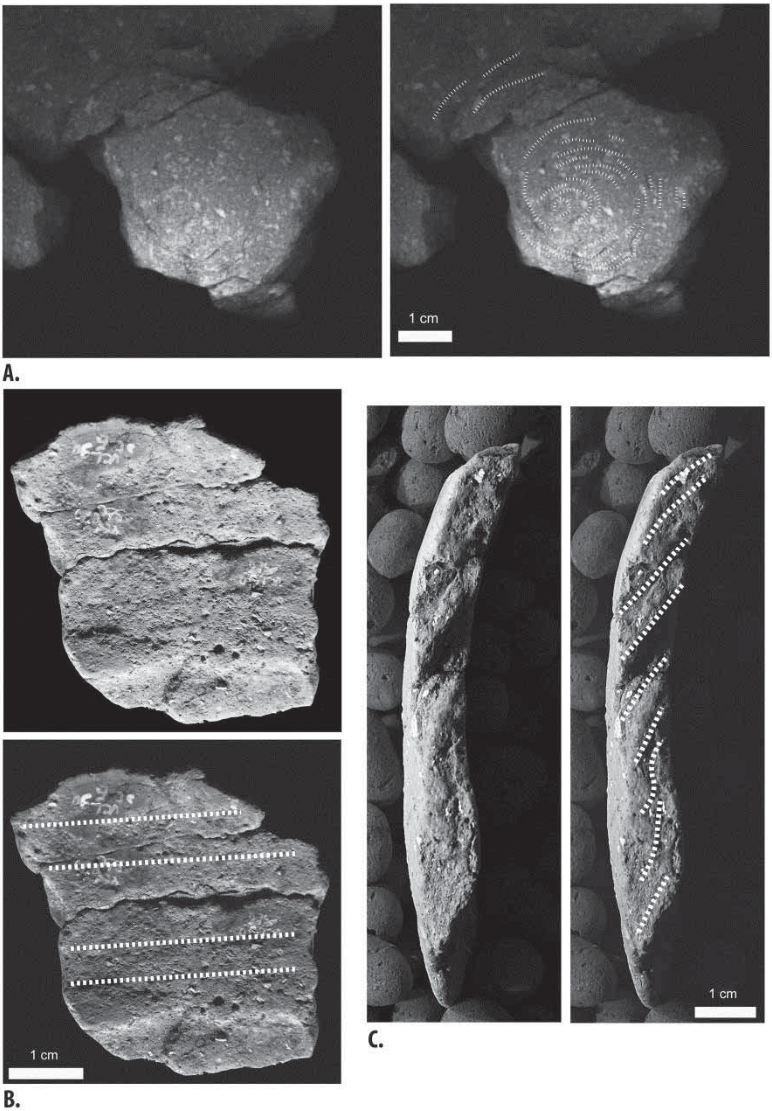


Fig. 7.4 Overview of the features characteristic of fashioning method 1 (VCL 90.6.8). A: Radiostructures observed on a base sherd (dashed lines: preferential orientations); B: Macrotraces (topographic variations) observed on inner surfaces of a lower body sherd; C: Macrostructures on a cross-section of an upper body sherd.

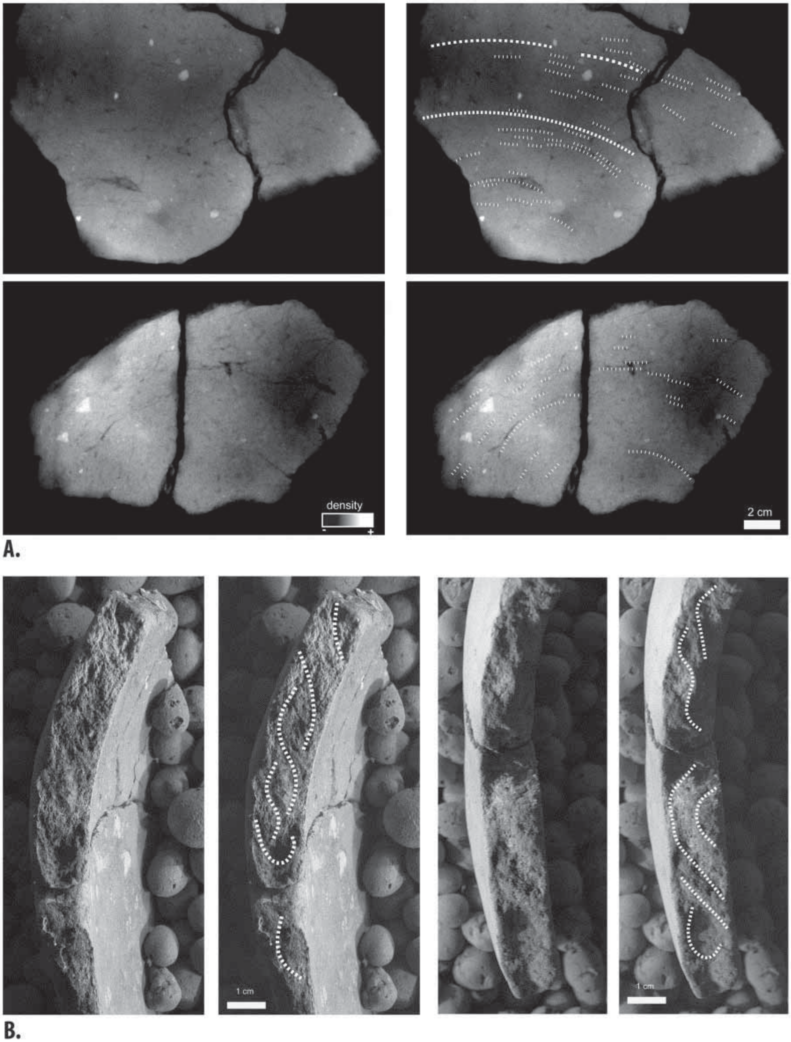


Fig. 7.5 Overview of the features characteristic of fashioning method 2 (VBT90.3.8). A: Radiostructures observed on lower body and base sherds (dashed lines: preferential orientations; bold dashed lines: density variations); B: Macrostructures on fresh cross-sections of upper and lower body sherds.

Macrostructures, however, differ substantially from method 1. In the upper as well as lower parts of the vessels considered here, elliptic features have been observed instead of a diagonal configuration. Diagonal features with an internal orientation regularly separate these elliptic features. Such configurations are frequently referred to as “S” (e.g. Bosquet *et al*. 2005; Gomart 2014; Livingstone Smith 2001a) or “N” patterns (e.g. Kahl and Ramminger 2012; Lindahl and Pikirayi 2010; Raemaekers and De Roever 2010) in the archaeological literature. As already demonstrated by several authors (Livingstone Smith 2001; Rye 1981; Van Doosselaere 2014), they can confidently be considered as resulting from coils assembled by superimposition or with a slight juxtaposition, subsequently deformed by a series of pressures, such as those induced by pinching. Few associated deformations probably occurred in our case, since there is still remaining evidence of the initial circular coils. Internal rather than external pressures are most likely responsible for the observed features, as most of the traces indicating processes of coil deformation (i.e. subcircular depressions) are located on inner surfaces. The exact fashioning sequence, i.e. whether it is initiated by the forming of the bottom or the top of the vessels, is, however, undeterminable.

Method 3:

A last group, comprising 28 samples, displays a series of characteristics that remain difficult to interpret (Tab. 7.1). Viewed in radiography, upper and lower parts of the vessels exhibit radically opposed configurations (Fig. 7.6). Upper body fragments are associated with latitudinal configurations clearly evoking coil addition, while lower body and base fragments are preferentially associated with a longitudinal configuration (marked by porosity and non-plastic inclusions forming discontinuous elongated patterns). This kind of configuration is usually related to drawing or moulding techniques (Livingstone Smith 2001a; Rye 1981; Van Doosselaere 2014). Yet, latitudinal features, mainly visible in radiography by density variations, are also present. This composite configuration suggests complex technical procedures. The association of a predominant longitudinal configuration with subordinate latitudinal features points to a fashioning method characterized by the drawing of a heterogeneous matrix made of assembled pieces—for instance rings or coils to form the lower body and a slab to fashion the base (for ethnographic equivalents, see Gosselain 2002; Livingstone Smith 2001a).

Macrotraces also mirror a structural discontinuity: inner as well as outer surfaces of lower body and base fragments, which apart from some small diffuse and merging reliefs show no clear configuration, are particularly regular, as opposed to the upper parts of the vessels, which are marked by clear latitudinal configurations. This is also the case for macrostructures: whereas lower parts of the vessels only show a few discontinuous longitudinal features, upper parts are characterized by elliptic features, separated by internally oriented diagonal features attributable to overlapping coils. Taken together, these observations suggest a fashioning method characterized by the practice of coiling to form the upper parts of pots and of drawing to shape the lower parts. While the rough-out of the lower body and the base is obviously made of assembled pieces, the exact structure of the initial matrix remains to be characterized. Another distinctive aspect of the samples associated with this fashioning method are the traces left by beating, which here are particularly well visible and cover large surfaces. Insistent beating operations during preforming are likely and could be partially responsible for the elongated character of the diagonal features observed in the upper parts of the pots (Fig. 7.6).

Spatial distribution

When examining the spatial distribution of the samples according to their technical attribution, one thing is immediately apparent: the three identified methods are almost systematically spatially associated. They indeed appear together in a majority of pits (Fig. 7.7, Tab. 7.2). The prevalence of method 1, which predominates in most of the features, must be underlined. It is followed by method 2, which also appears in significant proportions in several pits. By contrast, a few exceptions apart, method 3 is only present in small amounts. Based on this general distribution pattern, and particularly the systematic co-occurrence of fashioning methods in most of the features, a possible coeval relationship can be hypothesized. Although firm conclusions are premature, this suggests that the life and/or deposition cycles of the corresponding ceramics may be more or less contemporary.

Morphological and ornamental characteristics

Each fashioning method is associated with various morphological classes and a large variety of ornamental techniques and patterns. Despite the absence of strong correlations between techniques, shapes, and decoration, a number of preferential associations can nonetheless be discerned.

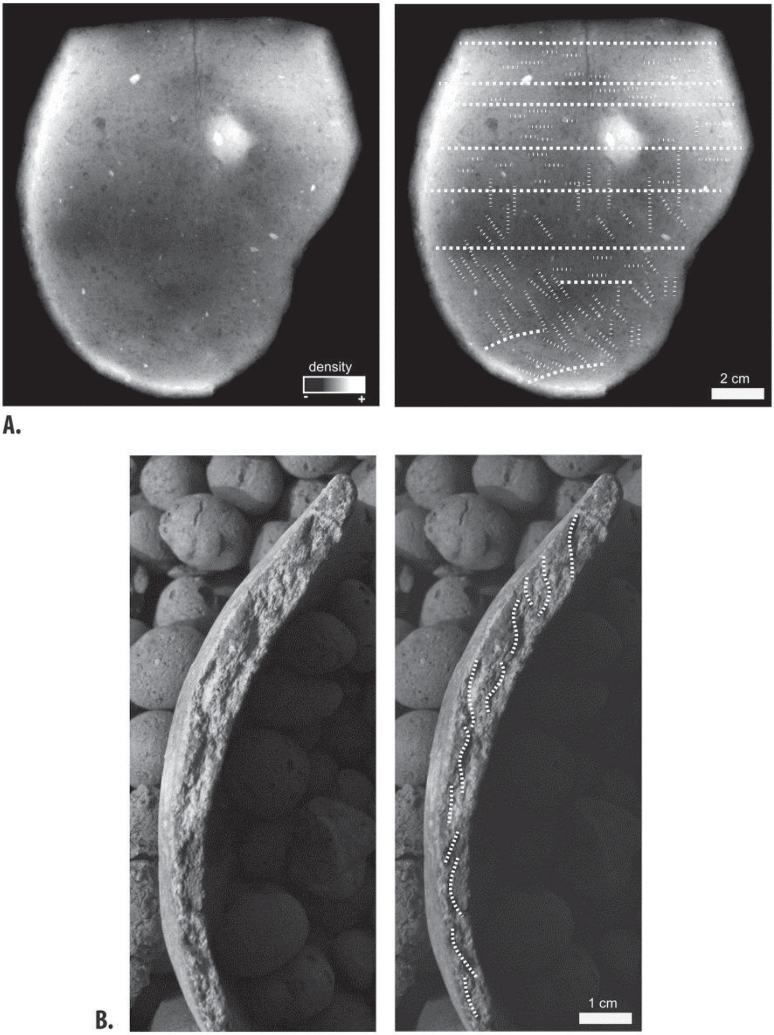
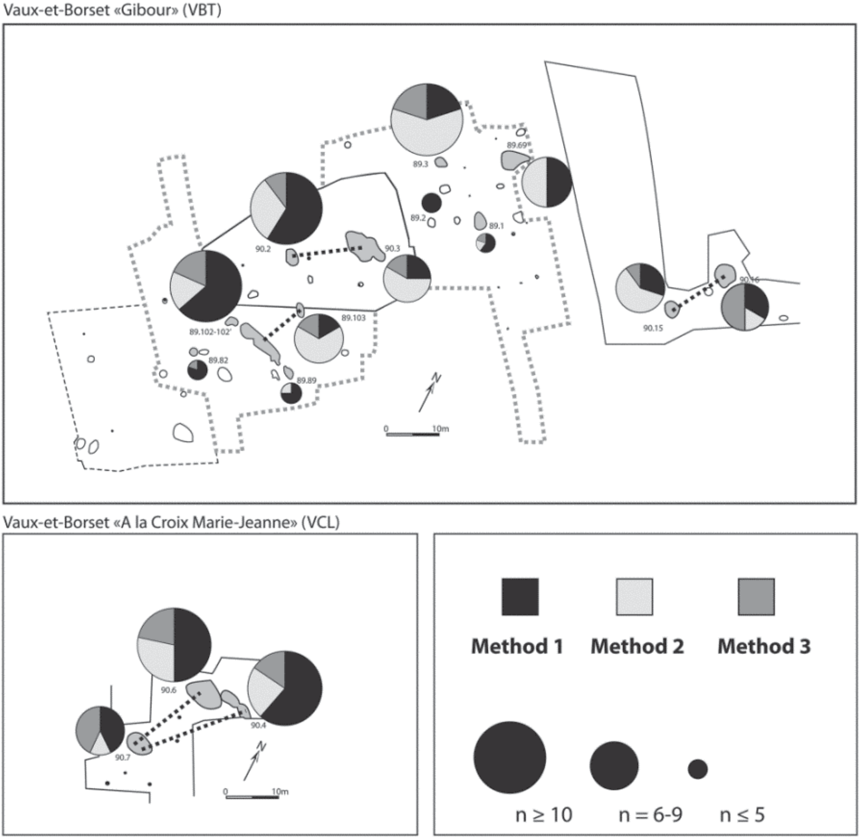


Fig.7.6 Overview of the features characteristic of fashioning method 3 (VCL 90.4.8). A: Radiostructures observed on a complete vessel (dashed lines: preferential orientations; bold dashed lines: density variations); B: Macrostructures on a cross-section.


Vaux-et-Borset «Gibour» (VBT)

Vaux-et-Borset «A la Croix Marie-Jeanne» (VCL)

Fig. 7.7 Spatial distribution of fashioning methods.

Regarding method 1, a close association with bottles (class 3) and pots (classes 2 and 4) can be noted (Fig. 7.8, Tab. 7.3). Corresponding vessels frequently exhibit multi-toothed comb impressions and herringbone or diagonal incisions. Strikingly, method 2 is predominantly represented by large storage jars (class 1) and large and medium-sized simple closed pots (class 4). When decorated, jars commonly bear garland or V-impressed motifs, while pots are in some instances associated with multi-toothed comb impressions, covering wide areas of the pots. Finally, method 3 mainly concerns small pots (classes 2 and 4), frequently bearing small knobs and/or perforated lugs.

Tab. 7.2 Frequency of fashioning methods by archaeological feature.

Feature ID	Method 1	Method 2	Method 3	Undetermined	TOTAL
VBT89 1	3	1	1	3	8
VBT89 102	14	4	4	11	33
VBT89 103	1	4	1	2	8
VBT89 2	4			1	5
VBT89 3	2	6	2	2	12
VBT89 56	1			1	2
VBT89 67					0
VBT89 69	4	4		4	12
VBT89 82	4		1	1	6
VBT89 87				1	1
VBT89 88				1	1
VBT89 89	3	1		12	16
VBT90 11					0
VBT90 15	3	6	1	5	15
VBT90 16	2	1	3	2	8
VBT90 17		2			2
VBT90 18		1		1	2
VBT90 2	23	12	4	18	57
VBT90 3	3	7	2	23	35
VBT93 30	1				1
VCL90 4	8	3	2		13
VCL90 6	7	4	3	6	20
VCL90 7	3	1	3	3	10
VCM98 2			1		1
TOTAL	86	57	28	97	268

Tab. 7.3 Frequency of fashioning methods according to morphological class.

Morpho-logical type	Method 1	Method 2	Method 3	Undetermined	TOTAL
CLASS 3	19	4		18	41
CLASS 2	33	18	12	32	95
CLASS 4	9	6	1	9	25
CLASS 1	12	2	12	13	39
CLASS 5	4	21		2	27
UNDETER-MINED	9	6	3	23	41
TOTAL	86	57	28	97	268

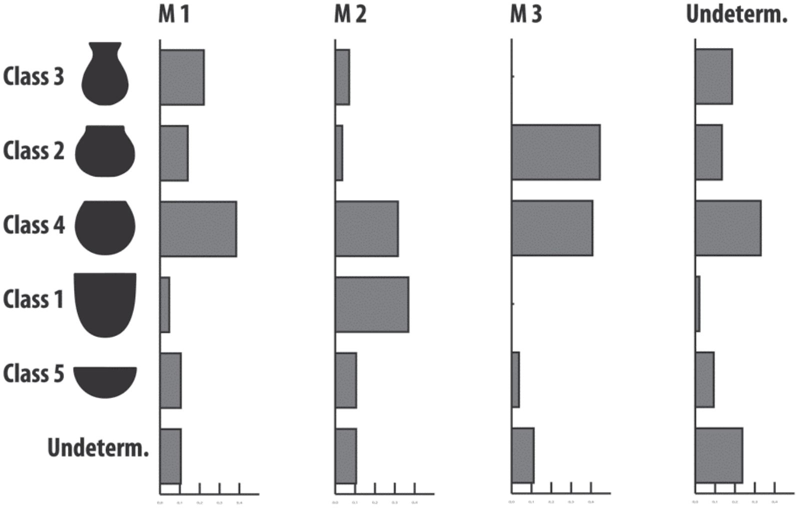


Fig. 7.8 Frequency of the morphological classes associated with the identified fashioning methods (expressed as % of the total per method).

Technical variability: what are the dynamics?

To sum up, three distinct fashioning methods have been identified:

- Method 1 is characterized by a roughing-out technique based on coil addition inducing severe deformation and an external overlap of the assembled pieces. Identified preforming techniques mostly consist in beating.
- Method 2 can be distinguished by a rough-out obtained by superimposed or slightly juxtaposed coils, with few associated deformations producing an internal overlap. As for method 1, the preform has probably also been subjected to beating.
- Method 3 is characterized by the drawing of a heterogeneous matrix consisting of assembled pieces and the overlap of coils, to rough-out the lower and upper parts of pots respectively. Intense beating has then been performed during the preforming step.

Notably, these three fashioning methods are associated in almost all the archaeological features, and in particular in those which seem functionally related to households.

How can this co-occurrence of various fashioning methods be explained? One possibility follows the social and cultural principles discussed at the beginning of this paper. This would imply the existence of three distinct apprenticeship networks and, by extension, three distinct, local or extra-local, communities of potters.

Other factors may, however, have played a role in the structuration of this variability. Correlations between pottery morpho-dimensional characteristics and fashioning methods have indeed been noted. Fashioning method 1 appears closely associated with bottles and pots, fashioning method 2 is preferentially associated with large vessels, most of them consisting of storage jars, while fashioning method 3 is associated with small subcircular pots bearing small perforated lugs or circular knobs. These trends could indicate that morpho-functional requirements and fashioning techniques were, at least partially, co-dependent.

From a theoretical perspective, three hypotheses can be formulated to explain this relationship between morpho-dimensional and technical aspects. The first hypothesis is that consumers acquired their pots from a single community of potters, who used distinct fashioning techniques depending on the morphology and the size of the product to be obtained. If so, however, there would probably be no overlap between fashioning methods for the same types of pots. A second hypothesis would be to consider that pottery consumers obtained their pots through selective interactions with different producer communities, each of them having its own technical set of practices and providing specific morpho-functional types. In this case, again, there would in principle be no overlap between fashioning methods for the same types of pots. A last hypothesis is to admit that pottery consumers at Vaux-et-Borset turned to various communities of potters, not only as a response to functional needs, but also as a result of more socially and culturally driven motivations (related for example to kinship networks, prestige concerns or ritual performance). This last hypothesis could explain the lack of a strict correspondence between morpho-dimensional classes and fashioning methods.

Both morpho-functional and socio-cultural factors may thus have been equally decisive in interactions between producers and consumers. These possibilities are not necessarily mutually exclusive, as shown by a large number of ethnoarchaeological cases where ethnolinguistic identity, gender, socio-professional status, symbolic aspects, economic considerations, and techno-functional constraints all operate concurrently in pottery producing and consuming strategies (Cunningham 2005; Degoy 2008; Gelbert 2003; Gosselain 2011; Mayor 2011).

Broadening the scope: BQ/VSG versus LBK

The variability identified here is not specific to the BQ/VSG assemblage of Vaux-et-Borset. It also characterizes a number of Early Neolithic ceramic assemblages from the Aisne valley (northern France). At Bucy-le-Long "le Fond du Petit Marais", a site dated to an early VSG stage, and at the neighbouring RRBP sites of Menneville "Derrière le Village", Berry-au-Bac "le Vieux Tordoir", and Bucy-le-Long "la Fosselle", four distinct fashioning methods appear together (Gomart 2010). These methods are in many aspects comparable to those identified at Vaux-et-Borset. Coiling techniques inducing an external or an internal overlap, as well as drawing, have seemingly been used to form either the base or the upper parts of pots. Moreover, beating is associated with most of these techniques. The existence of several apprenticeship networks distinguishing several pottery-producing communities has been advocated to explain the coexistence of these different fashioning methods. Interestingly, morpho-dimensional factors may also have played a role in this variability, leading to preferential associations between forms and techniques comparable to those observed at Vaux-et-Borset. Within these assemblages, small subspherical vessels are indeed preferentially associated with drawing and beating, while large jars are associated with coiling techniques. These similarities between the BQ/VSG assemblage from Vaux-et-Borset and the Aisne valley assemblages are not without significance, as they highlight a strong similarity.

Other significant connections emerge from this comparative exercise. A particular emphasis should be put on the convergence between fashioning method 1 identified at Vaux-et-Borset, which is characterized by a coiling method producing an external overlap and beating operations, and the Limburg fashioning techniques as identified by Gomart (2014) in the assemblages of Cuiry-lès-Chaudardes (Aisne Valley), Aubechies "Coron Maton" (Hainaut), Rosmeer, and Fexhe-le-Haut-Clocher (Hesbaye). Furthermore, at Rosmeer and Fexhe-le-Haut-Clocher, two sites located only a few kilometres away from Vaux-et-Borset, the internal overlapping of coils has also been recognized (Bosquet *et al*. 2005; Gomart 2014; Gomart and Burnez-Lanotte 2012). Notably, the internal overlapping of coils was mostly identified on LBK vessels, whereas external overlapping is strongly associated with Limburg pottery (Gomart 2014; Gomart and Burnez-Lanotte 2012). Again, these similarities point to a continuity between the BQ/VSG and the LBK, but also to strong links with Limburg pottery.

Conclusion

It has long been acknowledged that BQ/VSG pottery could be characterized by an important technical variability (Demarez *et al*. 1977; Farruggia *et al*. 1982). This has particularly been highlighted in studies devoted to the characterization of raw material acquisition and processing techniques (Constantin 1994; Livingstone Smith and Jadin 1993; 2003). According to our results, a significant technical variability is also impacting fashioning techniques.

Our detailed reconstruction of fashioning techniques, by means of systematic macroscopic examinations and standard radiography, allowed us to identify three distinct fashioning methods in the BQ/VSG corpus of Vaux-et-Borset (two different coiling methods and a third method based on the drawing of a heterogeneous matrix). These results are in line with available data on the BQ/VSG pottery from the Aisne valley, which exhibits similar technical characteristics (Gomart 2010).

This could indicate that a kind of socio-cultural plurality may be constitutive of the BQ/VSG in Hesbaye and in the Paris Basin. If, as advocated by several authors (e.g. Berg 2008b; Gosselain 2002; Mayor 2011; Roux 2011), craft skills at the fashioning stage are transmitted through specific apprenticeship networks, and if this situated experience is also the vector of social and cultural transmission, and more particularly of the most deeply-rooted facets of identity, then the co-occurrence, at the site scale, of distinct fashioning methods may indeed be considered as resulting from socially and/or culturally differentiated communities of potters.

Moreover, there is also some evidence that not only morpho-functional, but also socio-cultural factors could have been decisive in consumption strategies, stressing that various and complex dynamics of interactions were probably at work at the producer/consumer interface (see above). How and at what level (region, site, household, or more nuclear entities) pottery producing and consuming communities were exactly differentiated and did interact with each other, however, remains to be investigated further.

Comparisons with available data regarding LBK pottery manufacturing processes allow further conclusions to be drawn. Technical similarities with RRBP ceramics on the one hand, and with Limburg ceramics on the other hand, are particularly striking. They provide further evidence of the filiation linking the BQ/VSG with the LBK[4], but also with one of its non-standard manifestations, i.e. Limburg pottery (Constantin 1985; 2013). There could thus be a kind of continuity in the transmission of knowledge related to pottery making between the LBK and the BQ/VSG periods. Whether we are facing a direct linear filiation (phylogenesis) or more integrative processes of evolution (ethnogenesis) (Collard and Shennan 2000) is, in the present state of knowledge, impossible to determine.

Altogether, this reveals that, beyond its apparent stylistic coherence (Meunier 2012), the BQ/VSG displays a strong tendency to diversity. How this diversity is exactly articulated and to what extent it is comparable to the well-known and widely acknowledged uniformity/diversity of the LBK (Modderman 1988)—to which the recurrent occurrence of Limburg ceramics largely contributes (Constantin 1985; 1994; Gomart 2014; Gomart and Burnez-Lanotte 2012)—has yet to be addressed.

Clearly, much remains to be done to solve such questions related to the organization and the scales of pottery production, consumption, and distribution systems. This requires more studies devoted to pottery *chaînes opératoires*, undertaken at regional but also site scales, and in both BQ/VSG and LBK contexts.

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Notes

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[1] The Blicquy and the Villeneuve-Saint-Germain have long been considered as two facies of the same group. Due to strong similarities in settlement patterns, lithic technologies, ceramic styles, and subsistence activities, they now tend to be treated as a single cultural entity (Ilett 2012).

[2] Referred to as Seine Basin Final Bandkeramik, or *Rubané final du Bassin de la Seine,* in the new chronological terminology proposed by Ilett and Meunier (2013).

[3] In order to reconstruct the main stages of the *chaîne opératoire* of pottery production (from raw material acquisition to firing stages), several analyses have been and will be performed on both archaeological samples and experimental replicas. Analytical tools include thin-section petrography, X-ray powdered

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diffraction, scanning electron microscopy coupled with EDS, electron microprobe analysis, standard x-radiography, and CT scanning. Full results will be published at a later date.

[4] Although only a very limited number of LBK vessels have for the moment been examined, elements of continuity with the LBK are also present at Vaux-et-Borset. The few analysed samples (n=5) reveal technical characteristics that are comparable to those of the BQ/VSG assemblage. Two fashioning methods, in many aspects similar to fashioning methods 2 and 3 identified in the BQ/VSG assemblage, have been recognized.

CHAPTER EIGHT

THE CHANGING ROLE OF LA HOGUETTE POTTERY IN AN LBK CONTEXT

DANIELA HOFMANN

The Mesolithic–Neolithic transition in central Europe: *plus ça change...*?

The Neolithization of central Europe has monopolized scholarly attention for many years. Recently, however, with the setting in of "transition fatigue" (Sheridan 2011, 391), it has been argued that the question of migration versus indigenous adoption should take second place to the kinds of social relations and practices that set a society apart as "Neolithic" and the further historical trajectories of these societies (Robb 2013; 2014). Nevertheless, the question of the origin of those involved in the transition has remained a central concern.

To begin with, aDNA has shown that population replacement in central Europe did occur at some point between the last known Mesolithic burials (so far all belonging to a U haplotype) and the first known Neolithic cemeteries (where individuals of U haplotype are very rare; Brandt *et al.* 2013). This most likely coincided with the arrival of Earliest LBK farmers[1], especially given the similarity of their genetic signature with that of Starčevo populations in Hungary, where the LBK is thought to have originated (Szécsényi-Nagy *et al.* 2014). This picture is as yet regionally restricted, as most skeletons sampled come from Hungary and eastern central Germany (Hofmann 2015). At the same time, a hunter-gatherer way of life may have survived over the longer term, not just on the North European Plain (see e.g. Amkreutz 2013), but also in areas very close to Neolithic sites. To name but a few examples, the human remains from the Blätterhöhle in North Rhine Westphalia suggest the simultaneous existence of a hunter-fisher lifestyle (associated with individuals of U haplotypes) and a farming lifestyle (followed by individuals of varied haplotypes) as late as the fourth millennium cal BC (Bollongino *et al.*

2013). Mesolithic patterns of wetland exploitation persisted until at least 5000 cal BC at Lake Schwarzenberg in Bohemia (Pokorný *et al*. 2010), as well as the Dutch Meuse–Rhine delta (Amkreutz 2013). In Saxony, Stäuble and Wolfram (2013) have identified sites with Mesolithic-style lithics (and occasionally burials) dating as late as the fifth millennium cal BC in areas adjacent to the loess landscapes occupied by early farmers, and a similar situation appears to apply in parts of western Germany (Banghard and Gehlen 2014; Knoche 2010). Although some of these contexts would benefit from more rigorous absolute dating, it seems that foragers continued to live in central Europe with little to no interaction with immediately adjacent farming groups. This is a challenging scenario which runs counter to purely migrationist, purely indigenist, and most of the integrationist scenarios proposed so far (notably the enthusiastic adoption of a farming lifestyle by locals that is said to follow initial leapfrog colonization).

These new data problematize the question of ethnic identity in new ways. Historically contingent and therefore mutable, ethnicity was lived out through multiple processes of colonization, resistance, fusion, and parallel existence, with all the actors involved capable of improvisation and change. As such, we must transcend the kind of transition narratives which have accorded agency either only to incoming farmers, who stamped their way of life onto a yielding substrate, or instead exclusively to foragers, seen as a creative, flexible, and open-minded counterpart to the static, rule-bound, and rather dull Linearbandkeramik (as critiqued e.g. in Robb and Miracle 2007). Here, I will attempt to work through some of the implications of material culture as an indicator of ethnic identity, using the example of the non-LBK pottery traditions produced on the western fringes of the Earliest LBK distribution, and in particular one of them, La Hoguette pottery[2]. While I do not claim to be able to solve the riddle of its makers and users, I hope to at least frame a new set of questions beyond the role of these vessels as straightforward indicators for ethnic groups throughout the whole sequence of their production. Rather than rejecting outright that pottery could ever function in this way, I will examine the changing interplay of La Hoguette and LBK pottery, both of which are dynamic and mutable traditions.

A potted history of La Hoguette ceramics

The La Hoguette phenomenon is one of several ceramic groupings along the western edges of the LBK's distribution, which also comprise Limburg ware and a by now bewildering array of associated styles commonly termed *Begleitkeramik*[3]. The majority of these vessels have come to light in pits on LBK sites, but their shape, manufacturing technique, and decoration differ starkly from LBK ware. Of these styles, La Hoguette was first identified by Jeunesse (1987) and named after a findspot in Normandy, but the majority of sites of this grouping are found along the upper Rhine and Neckar (Fig. 8.1), with outliers for instance in the Weser mountains, in the Netherlands, and along the Rhône corridor (e.g. Brounen and Vromen 1990; Günther 1991; Pétrequin *et al*. 2009). At most of these sites, there are less than 20 sherds of La Hoguette pottery (Manen and Mazurié de Keroualin 2003, 119).

La Hoguette vessels (e.g. Fig. 8.2) are coil-built, thick-walled, conical containers with a pointy base and a variety of tempers. The typical decoration which allows identification as a La Hoguette pot consists of raised garlands framed by bands of incised dots made with multi-toothed tools, which is generally linked to Mediterranean Cardial and Epicardial groups. Generally, in view of the fundamental differences to LBK pottery, most scholars support manufacture by a distinct ethnic group (e.g. Gronenborn 1999; Lüning *et al*. 1989, 371–379; Manen and Mazurié de Keroualin 2003, 119; Roussot-Larroque 1993, 24–28).

Yet La Hoguette ceramics do not all show every one of these allegedly Mediterranean elements. Not all vessels are decorated, while others show rather idiosyncratic motifs and technological choices not typical for the Cardial sphere. This is the case for bone temper (Lüning *et al*. 1989, 391; Van Berg 1990, 176), but also for the garlands of raised cordons and dots on La Hoguette pottery, which are actually rare in Cardial assemblages. All this points to a selective adoption of only some elements (Pétrequin *et al*. 2009), paired with considerable transformations. These could have been added at various points during the transmission to central Europe, probably along the Rhône corridor. There and in surrounding regions, several similar ceramic groups have been defined over the years, which can variously be associated with Mesolithic-style lithics, a reliance on hunting and gathering, and the occasional appearance of domesticates (e.g. Roussot-Larroque 1990; 1993). Even the Epicardial itself may be an initial adaptation of the Cardial style by inland foragers (Jeunesse and Van Willigen 2010). We should therefore not expect a single and clear source area for La Hoguette pottery, but instead see it as the outcome of a more creative fusion process (Jeunesse and Van Willigen 2010; Lüning *et al*. 1989, 388f; Manen and Mazurié de Keroualin 2003, 138).

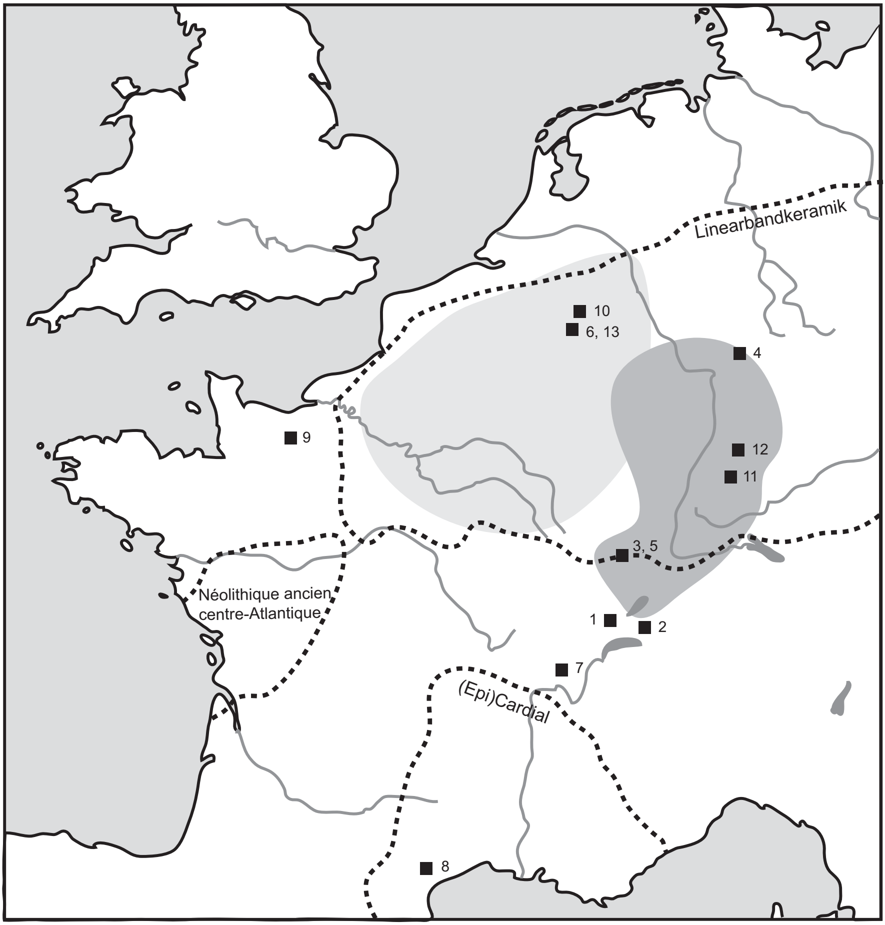

Fig. 8.1 Map showing the distribution of the main Neolithic cultures around 5100 cal BC (dotted lines) and the La Hoguette (darker shading) and Limburg (lighter shading) groups, with location of main sites mentioned in the text. 1 Abri de la Cure; 2 Arconciel la Souche; 3 Bavans; 4 Bruchenbrücken; 5 Choisey; 6 Fexhe-le-Haut-Clocher; 7 Grotte du Gardon; 8 Grotte de Gazel; 9 La Hoguette; 10 Rosmeer; 11 Rottenburg–Fröbelweg; 12 Stuttgart–Bad Cannstatt; 13 Trou Al' Wesse. Map after Manen and Mazurié de Keroualin (2003, 139, fig. 7).

Used as evidence for the experimentation of indigenous hunter-gatherers with elements of a Neolithic life-style, La Hoguette and similar pottery styles were seamlessly fitted into narratives of the active role of foragers in adopting a Neolithic way of life (e.g. Crombé 2009, 483;Jeunesse *et al*. 1991; Roussot-Larroque 1990; 1993; Van Berg and Cahen 1993). For example, it is argued that LBK expansion may have halted along the Rhine because of a strong La Hoguette presence there (e.g. Lüning *et al*. 1989, 391), while it was Limburg ware which inspired the stylistic differences between pottery of the Paris Basin LBK (the RRBP) and that from regions further east (e.g. Jeunesse 2001; Roussot-Larroque 1993, 32; Van Berg 1990; Van Berg and Cahen 1993). These kinds of models treat ceramic styles as social entities, consistent with culture historical narratives. Indeed, as Manen and Mazurié de Keroualin (2003, 133) point out, we are beginning to treat non-LBK ceramic phenomena, such as La Hoguette, as full-blown "cultures", with all the implications of coherent ethnic groups this term brings. This is in spite of the fact that recurrent associations of such ceramics with clearly Mesolithic material are hard to come by (see also Hauzeur 2009, 176).

At the Bavans rock shelter in the Doubs region of eastern France, La Hoguette ceramics were found near the base of layer 5 together with Late Mesolithic styles of arrowhead, while LBK ceramics are allegedly confined to the top half of the layer. There are some domesticates, mainly sheep/goat (Aimé 1987; 1992; Aimé and Jeunesse 1986; Chaix 1997; Jaccottey 1997), resulting in a neat "package" of pottery style, lithic tradition, and economic choice. However, several authors have cast doubt on the integrity of layer 5 (Allard 2005, 139; Perrin 2002), in spite of recent attempts at clarifying the stratigraphy (Jaccottey 1997). Available radiocarbon dates scatter between the first half of the sixth to the very start of the fourth millennium and strongly suggest that admixture has occurred (Perrin 2002).

Associations of La Hoguette pottery with known Late and Final Mesolithic flint types are rare elsewhere, and many are not particularly trustworthy (e.g. also the Abri de la Cure, compare Jeunesse *et al*. 1991 and critical comments by Perrin 2002). With the exception of Stuttgart–Bad Cannstatt (see below), there are few watertight connections of La Hoguette ware to any "Mesolithic" lithic types[4]. Such flint types occur in the same areas as La Hoguette pottery, but actual associations are rare (Manen and Mazurié de Keroualin 2003, 125). Similarly, further north, Limburg ware remains conspicuously separate from the vibrant Late Mesolithic traditions of the Dutch and Belgian wetlands (e.g. Amkreutz *et al*. 2010; Brounen *et al*. 2010). In terms of a culture historical definition, then, La Hoguette pottery is not part of any coherent cultural package consisting of recurrent associations of different kinds of material (Crombé 2009, 483).

While most researchers agree on this conclusion, it has been interpreted in diametrically opposite ways. For those who adhere to the idea of local foragers adopting pottery, this exemplifies the adaptability and flexibility so characteristic of hunter-gatherers, who can seemingly combine cultural elements at will, while the LBK is seen as a rigid canon of rules imposed from the outside (e.g. Jeunesse 2009). For critics of this interpretation, the lack of coherent associations is the main argument for dismissing a central role of La Hoguette pottery in Neolithization scenarios. For instance, Constantin *et al*. (2010, 43) point out that vessels are sometimes simply classified as La Hoguette or Limburg on the basis of one defining trait, such as bone temper, even if other indicators such as shape would rather support an attribution to the LBK. Also, on most sites such non-LBK pottery is discarded in ways and locations no different to Bandkeramik vessels (e.g. Constantin *et al*. 2010; Maletschek 2010). Finally, the very large territories over which La Hoguette or Limburg pottery are distributed, over 100,000 km^2, contrast with the much more localised lithic traditions of Mesolithic ancestry (Constantin *et al*. 2010, 41). Therefore, for Constantin and colleagues, LBK farmers themselves could well have produced these atypical wares, perhaps for some kind of special function.

Other problems remain. One is the variability of these non-LBK pottery traditions, which seems to be increasing all the time. For instance, *Begleitkeramik*, first defined by Jeunesse and Sainty (1991), itself occurs in at least four distinct styles, one involving cannelured or grooved decoration (Brounen and Hauzeur 2010). Vessels in hitherto unknown styles continue to be discovered (e.g. Bosquet 2010), and increasingly there are items which are attributed to one group on technological grounds, but are closer to another in terms of shape or decoration. The repertoire is diversifying[5], but the implications remain underdiscussed. Do we really need more stringent definitions of various styles, or will any such endeavour be ultimately frustrated by yet more transitional forms and recombinations? And in the absence of strict criteria, what is the most important trait for assigning a given sherd to a named complex—decoration, shape, temper, or something else entirely (see Golitko and Bosquet 2011, 86; Van de Velde 2010, 77)?

Dating, too, remains poorly understood. La Hoguette pots east of the Rhine are generally found in pits dated to the Earliest LBK culture; occurrences in later phases are from areas into which the LBK expanded only secondarily (e.g. Hald 2006; Hald and Schlichtherle 2005). Further west, in Alsace, La Hoguette pottery is found throughout the local LBK sequence (Manen and Mazurié de Keroualin 2003, 120). Attempts at an internal phasing of La Hoguette pottery, which would allow to stylistically date pieces found away from LBK sites, have remained tentative, as has the definition of regional groups. It has been suggested that vessels with narrower decorative bands are more common in the east, while bands in the west are wider. Yet overall, it remains hard to disentangle chronological and geographical factors (Lefranc 2008; Manen and Mazurié de Keroualin 2003, 120). Perhaps attempts based on technological criteria, tracing the transmission of the actual know-how of pottery manufacture, will ultimately be more successful (Kirschneck in prep.).

Absolute dates for La Hoguette remain few and disputed. The Bavans rock shelter has yielded dates before 5800 cal BC which are allegedly associated with La Hoguette pottery (Jaccottey 1997, 314), and the ^{14}C dates from the Trou Al'Wesse cave in Belgium similarly fall around 5700 cal BC (Miller *et al.* 2009; 2012)[6]. Yet the stratigraphies are ill understood, with redeposition and admixture a constant problem, and it is by no means clear that the material on which the ^{14}C dates were obtained is a reliable indicator for the age of the pottery. Correlations with specific Cardial phases also remain problematic (e.g. Gronenborn 2009, 532; 2011, 70f; Van Willigen 2004). While this issue needs urgent attention, it cannot be tackled further here.

Yet what can be attempted, even with the evidence currently available, is to turn our attention from the definition of rigid types and packages towards a more contextual approach. How are such non-LBK ceramics actually involved in various kinds of practices? Are there distinctions and similarities—both between the different groupings so far identified, and between these and LBK pottery—in making, use, and discard? Any answer will need to accommodate the controversially discussed characteristics of La Hoguette pottery: its difference from LBK wares and similarity to a host of other traditions; the lack of clear boundaries between these traditions; the geographically extensive distribution of these vessels; and finally, the differential trajectory of quick disappearance in some parts of the LBK distribution and longer survival in others. I will approach these issues by comparing the different situations in which such pottery is found: outside LBK sites; as short-lived fusion phenomena; and as longer-term presence within an LBK context, in which the social role of pottery also changed over time. While the focus lies on sites identified as La Hoguette, I will draw on similar evidence concerning Limburg pottery and *Begleitkeramik* where necessary.

La Hoguette pottery outside LBK settlements

La Hoguette pottery found away from LBK sites has been crucial for supporting the idea of a separate ethnic grouping manufacturing these items. Mostly, however, only single vessels or sherds have been recovered, prompting the question of why pottery was adopted in the first place and how it was used in a hunter-gatherer context. This has long been discussed at a global scale, as the investment needed for pottery production (particularly in terms of time and fuel) seems to outweigh the usefulness of a relatively fragile and heavy container for mobile groups. For Brown (1989, 203, 218), the main advantages of pottery are that it can be left unattended directly on the fire and that it is easier to step up container production, as larger batches of pots can be fired at virtually the same material cost. This means that pottery would be an expected choice where the demand for vessels had increased and enough time was spent in the same place to allow production, for instance at larger gatherings of people among semi-sedentary hunter-gatherer groups (Jordan and Zvelebil 2009, 51). Also, pottery is very well suited for producing certain labour-intensive foodstuffs, such as plant- or animal-based fats and oils, alcoholic beverages, and anything requiring the boiling of cereals or nuts (Brown 1989, 220; Hayden 2009; Jordan and Zvelebil 2009, 58).

At a global scale, there is also an association between pottery-producing hunter-gatherers and wetland habitats, both because some wetland resources are time-consuming to process and because their predictability allows larger gatherings (e.g. Rice 1999, 31–41). In Europe, this situation seems particularly pertinent for the circum-Baltic region, where it has been linked to emergent complexity (Jordan and Zvelebil 2009). The production of labour-intensive vessels and/or labour-intensive and novel foodstuffs can easily be incorporated into a narrative of increased status competition in the form of feasts (Hayden 1995; 2009; Rice 1999, 41).

The situation for La Hoguette pottery seems somewhat less clear-cut. There is no clear link to aquatic resources, nor indeed to just one particular kind of environment across its distribution. The generally small quantity of vessels[7] is inconsistent with large-scale batch production, and there are few indicators for hunter-gatherer “complexity” across central Europe (generally defined as increased sedentism, storage, and the use of material culture to promote social divisions, for instance through richly furnished burials; e.g. Neely and Clark 1990; Zvelebil 1990; for critical comments see Finlayson 2009). Nevertheless, arguments of competition and status display could also be relevant for areas into which pottery expanded

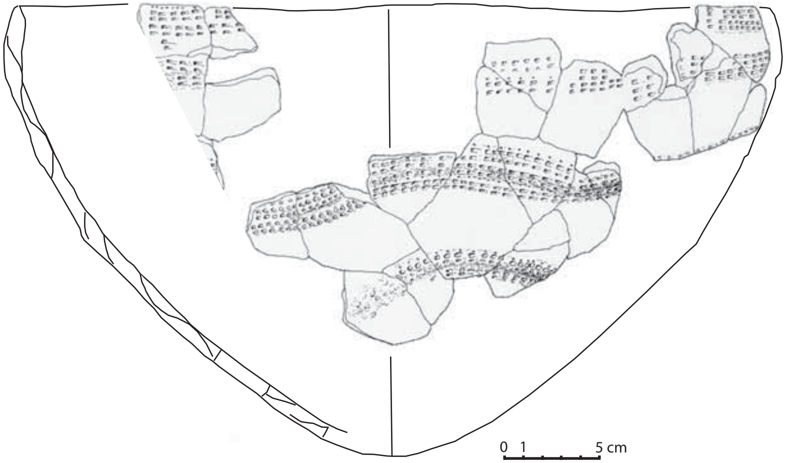

Fig. 8.2 The La Hoguette pot from Choisey (from Pétrequin *et al.* 2009, fig. 3; reproduced with kind permission of P. Pétrequin).

secondarily, and where it could have functioned more directly as an exotic artefact that required special knowledge or contacts to obtain or produce (Helms 1988; Rice 1999). This scenario could be relevant in the La Hoguette case.

At the site of Choisey (Franche-Comté), well outside the LBK distribution, an exceptionally well-made La Hoguette vessel was seemingly simply abandoned on the old ground surface (Fig. 8.2) (Pétrequin *et al.* 2009, 493). It was made from local clay and tempered with crushed quartz and tiny amounts of burnt bone. The exceptional size of the vessel and its neat decoration suggest production by part-time specialists (Pétrequin *et al.* 2009, 512f). These may have been actual migrants from further south—perhaps married-in wives—who followed the networks also travelled by Mediterranean goods such as *Columbella rustica* shells (Álvarez Fernández 2003). The first vessels produced by these new potters would be for ostentation, perhaps for displaying new foodstuffs such as cereals, which have been identified in pollen spectra for the fifty-fifth and fifty-fourth centuries at Chalain, 50 km from Choisey (Gronenborn 2014; Pétrequin *et al.* 2009, 510f).

Other examples support this conclusion of special containers, even if the early dating of cereal pollen remains controversial (Behre 2007). Several vessels are of exceptional size, for instance that from Grotte Gazel in southern France, which could have held over 60 litres of liquid

(Guilaine and Manen 1997, 302). In addition, prestige networks could explain the wide distribution of these ceramics, placing them in the same category of objects as the Greek-inspired clay pintadera from the rock shelter of Arconciel–La Souche in canton Fribourg, Switzerland (Mauvilly *et al*. 2008).

Early instances of domesticates may fit in, too. At the Grotte du Gardon in the southern Jura, where the pottery bears close similarities to the geographically removed Limburg style, limited percentages of domestic animals (cattle and sheep/goat) are present in what is otherwise a hunter-gatherer context. In addition, the remains of at least five defleshed people have been recovered. Animal bone, human bone, and pottery cluster in the same areas of the cave, close to the hearths (Chaix 2009; Chiquet and Chaix 2009; Manen and Convertini 2009).

There are a few sites for which contextual detail is more plentiful. At Stuttgart–Bad Cannstatt in Baden-Württemberg, La Hoguette sherds were discovered in association with a Mesolithic lithic industry and bone harpoons, wild animal bone, and the remains of small domesticated ruminants (Schütz *et al*. 1992; Strien and Tillmann 2001). The site lay on boggy ground in an area of braided channels near the Neckar. People had no major impact on the landscape, but may have maintained patches of open ground to encourage the growth of hazel (Kalis *et al*. 2001). The excavators suggest seasonal gatherings in spring or autumn (Kalis *et al*. 2001).The appearance of domesticates here seems to have had little impact on day-to-day existence[8], and indeed remains contentious. Counts of wheat and poppy pollen are not high enough to suggest agriculture, but may show that small quantities of these plants were processed at the site. The only cereal macrosample and at least some of the animal bone are of much later date (Kalis *et al*. 2001, 652–670), but Strien and Tillmann (2001, 674) believe that the more thoroughly fragmented sheep bones are associated with the La Hoguette pottery.

Several explanations have been suggested for the role of domesticates here. A ^{14}C date of 5460–5290 cal BC obtained on a food crust from a La Hoguette vessel (Kalis *et al*. 2001) means that Bad Cannstatt could overlap with the Earliest LBK presence in the wider region[9]. Alternatively, isolated domesticates could have been obtained—either on the hoof, or as choice cuts—through longer-distance networks. Certainly, the vegetation cover around Bad Cannstatt shows no evidence of intensive grazing episodes (Kalis *et al*. 2001). Yet we cannot currently distinguish the conspicuous consumption of exotic resources during competitive feasts from an occasional dietary supplement prepared in a more routine setting.

In sum, in these kinds of contexts it is tempting to see La Hoguette pottery and related wares as artefacts which stressed hunter-gatherer connections and were employed in long-range exchange networks. Whether this implies individual aggrandizers is another matter. Jordan and Zvelebil (2009, 64f) have suggested possible alternatives of pottery making and food preparation in a more open setting of reciprocal sharing of resources and knowledge.

Much additional information would be needed to decide between these scenarios. Studies on the *chaînes opératoires* of vessels found at different sites could be employed to trace the lines of transmission of manufacturing know-how (see below). It would also be interesting to know what kinds of foodstuffs were present in La Hoguette vessels[10], but it is a reliable dating framework that is the most urgent requirement. The question is not just how long, or indeed whether, La Hoguette pottery existed before the arrival of Earliest LBK farmers, but also whether there were any developmental trends. For instance, Pétrequin *et al*. (2009, 513) claim that the great skill shown by items such as the Choisey pot was subsequently diluted as more people began making pottery of smaller size and lower quality. Yet currently, the dating evidence connected with La Hoguette pottery is not sufficient to either independently trace the speed of its spread, or to identify any stylistic development within it. It is thus possible that the roles and functions of such pottery may have been varied and contextually dependent from the start, rather than following an evolutionary trajectory.

In either case, a role of pottery as part of far-flung networks of exotics, whether strictly speaking circulating as “prestige goods” or simply as tokens of alliance, has the virtue of explaining the large geographical extent of these phenomena and the way in which they transcend boundaries suggested on the basis of other material, such as personal ornaments (Newell *et al*. 1990). In this way, rather than seeing these pottery styles as a means for drawing up boundaries between ethnic groups, they would be stressing links and interactions, with exotic and novel motifs and practices possibly additionally valued. In such a context, individual motifs or decorative styles could have travelled widely, creating the fuzzy stylistic boundaries we in fact observe. The question at this point is not whether hunter-gatherers or farmers produced these wares—the former solution seems the best fit for those cases in which La Hoguette pottery occurs on its own, away from LBK sites—but whether such hunter-gatherer ceramics were able to maintain this role once they began to appear on LBK sites.

Technical know-how, acculturation, and coexistence

Incoming LBK farmers would certainly have disrupted existing networks and eventually would have impacted on indigenous landscape use. This is also suggested for Bad Cannstatt, where the arrival of Earliest LBK colonists in the more immediate environs is cited as a probable reason for abandonment (Kalis *et al*. 2001, 671). Nevertheless, recognizable fusion processes were also taking place. At Rottenburg–Fröbelweg in Baden-Württemberg (Fig. 8.3 A), Earliest LBK longhouses were constructed on a gravelly patch in the floodplain of the Neckar, rather than on the loess terrace, and the animal bone assemblage comprises almost entirely wild species (Bofinger 2005, 93f; Stephan 2005). A staggering 419 La Hoguette sherds, most of them very small, were also recovered (Bofinger 2005, 93f). If a fusion of "Neolithic" and "Mesolithic" traits ever took place in central Europe, then the result would definitely look something like this. Interestingly, this admixture also extends to the manufacture of pottery. Three of the sherds with La Hoguette motifs and vessel shapes were built out of a clay mixture almost indistinguishable from Earliest LBK ware. Thin section was necessary to reveal tiny bits of bone temper (Bofinger 2005, 100). Who was imitating who here?

However, where La Hoguette came into contact with Earliest LBK farmers east of the Rhine, such processes were short-lived. At Bruchenbrücken, an Earliest LBK site in Hessen with a location and animal exploitation pattern that conform much more closely to the LBK norm, La Hoguette pottery was locally made and discarded like LBK ware (Maletschek 2010), particularly around houses in the western part of the site (Fig. 8.3 B). Yet, it apparently had no lasting impact in terms of a stylistic or technological legacy. House 10, the latest in the sequence, no longer yielded any La Hoguette sherds, which in any case make up less than 1.5 % of the ceramic inventory (Maletschek 2010). This is in spite of the fact that a Mesolithic impact has long been argued for techniques of lithic manufacture at this site (Gronenborn 1997). While pottery-using hunter-gatherers could easily have survived in the large empty spaces between Earliest LBK settlements, where they came into more direct contact with Earliest LBK farmers, and where they cohabited, assimilation of pottery production took a few generations at most. This is consistent with the idea that La Hoguette and LBK pottery were indicative of two identity groupings, one of which eventually ceased to manifest itself in this way.

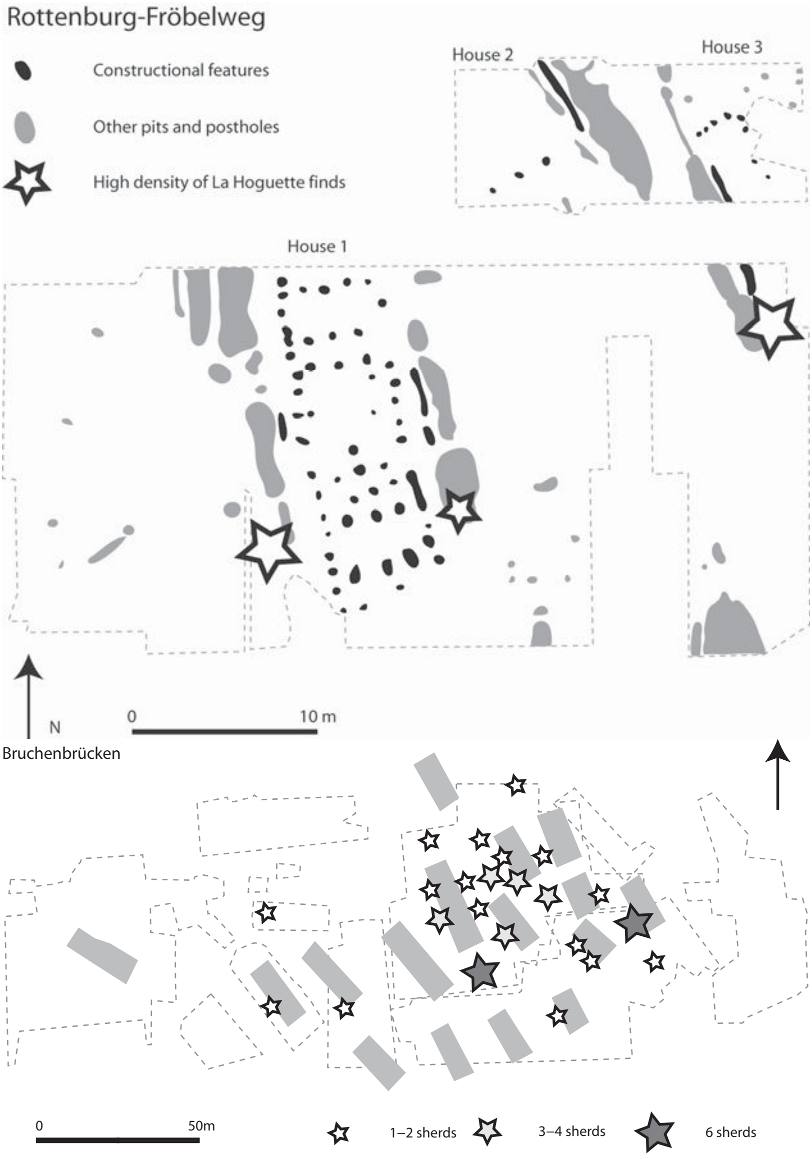

Fig. 8.3 Distribution of La Hoguette sherds around houses in A) Fröbelweg and B) Bruchenbrücken. A) after Bofinger (2005, 107, fig. 65), B) after Maletschek (2010, 91, fig. 11).

This situation is very different in areas in which the earliest interaction between foragers and farmers took place only after the Earliest LBK. In these areas, La Hoguette pottery continued to be made, for example appearing in all phases of the Alsatian LBK sequence. It has also been argued that non-LBK ceramics had a direct impact on LBK pottery traditions, as certain motifs—such as the ladder motif in Alsace—are said to be directly borrowed from the La Hoguette canon (e.g. Jeunesse and Winter 1998). There are also fusion phenomena from further north. At Geleen–Janskamperveld in the Netherlands, several styles of non-LBK pottery coexisted, and often Limburg motifs and other, more unusual decorations are paired with LBK-like manufacturing techniques, producing well-fired pottery with fine or "invisible" tempers (Van de Velde 2010). Similarly, LBK-style decoration was added to vessels of Limburg shape and technique at Belgian sites (Golitko and Bosquet 2011, 90).

Unfortunately, studies that allow us to trace the merging of technological know-how in its entirety are still rare, and so far restricted to single sites. At Rosmeer in Belgium, 34 sherds were investigated from the point of view of their *chaînes opératoires*. Looking at coiling technique, temper, surface treatment, decoration, and firing, Gomart and Burnez-Lanotte (2012, 245f) defined two broad traditions of production. In tradition A, the stacked elliptical coils are joined to each other alternately on the outer and inner surface. The most common temper is grog, although bone and haematite can also occur. Some vessels feature an orange slip. The decoration can consist either of LBK or quite diverse non-LBK motifs executed with a range of tools. In contrast, in tradition B the coils were always joined to each other on the outer surface only—a difference in motor habits that had little impact on how the vessel looked, but indicates chains of craft transmission, Van de Velde's (2010, 74) "differently habituated people". In this group, only vessels with non-LBK decoration occur, and bone temper is more frequent. An orange vessel colour could be achieved by oxidized firing, as well as slip. Tradition B was spatially restricted to one area of the village, while vessels with non-LBK motifs manufactured in tradition A could appear across the site—similar to the situation for La Hoguette pottery at Bruchenbrücken (see above). The authors conclude that those potters trained in tradition B were "specialists" in the sense of producing only non-LBK vessels. These must have been culturally valued, as other potters (socialized in tradition A) made similar-looking containers in addition to their LBK output. Alongside decoration, there was some limited technology transfer concerning tempers, but basic motor habits and controlled oxidized firing were not copied between traditions (Gomart and Burnez-Lanotte 2012, 247f). In this scenario, then, there is enough overlap between manufacturing technique and decoration to suggest two different groups of pottery makers, one of which was willing to occasionally imitate parts of the other's repertoire. There are, however, no examples in which LBK and non-LBK motifs are mixed on the same vessel.

While Gomart and Burnez-Lanotte (2012, 248) caution against an ethnic interpretation of these differences, as both groups of makers lived in the same community and otherwise shared the same material culture, for Crombé (2009, 485) it is clear that the intention was to create social boundaries. Perhaps, however, we are simply seeing the continuation of an older pattern in which some vessels were connected to specific practices of display and the shared consumption of food, and by virtue of these traditional associations could be readily incorporated into new sorts of situations. Even if the makers of tradition B pots were in some sense set apart, for those producing tradition A vessels with both LBK and non-LBK styles these differences were not insurmountable barriers. They seized the chance to transfer these valued associations to their own products, breaking down boundaries.

Pottery could also still travel. At Fexhe-le-Haut-Clocher in Belgium, the spatially isolated "founding building"—the first structure on the site—yielded four non-LBK vessels: a typical Limburg pot with herringbone pattern; a Limburg-style pot with an angled motif executed in the stab-and-drag technique otherwise associated with the Later LBK; and two grog, quartz, and charcoal tempered sherds of an unknown style with vertical grooves and a horizontal ladder motif. Based on clay composition, none of these sherds were made locally at Fexhe (Bosquet 2010). Exchange is not restricted to non-LBK wares. A mineralogical and chemical examination of 400 sherds from the Belgian Hesbaye cluster revealed that around 50 were of non-local manufacture. This included both LBK vessels and Limburg-style pottery, which appear to have originated in the same areas (Golitko and Bosquet 2011). Both styles could thus be used to stress connections.

It is of course dangerous to transfer the conclusions reached for Limburg pottery in a restricted geographical area to all non-LBK wares elsewhere. Yet it can serve as a provisional model until comparable data does become available. It thus appears that where hunter-gatherers came into contact with Earliest LBK farmers, as at Bruchenbrücken, coexistence and ceramic experimentation lasted a few generations at most. Where Middle and Late LBK farmers were the interaction partners, there are more indicators for transfers and interaction. The stylistic diversity of non-

LBK pottery increases and pottery continues to be traded, while LBK-trained potters experiment with producing unfamiliar decorations. At this juncture, the idea of La Hoguette, Limburg, and others as "hunter-gatherer wares" begins to work less well. To understand these varying trajectories between early and late contact, we must now investigate the second partner in this interaction, the LBK. Here, too, pottery played a variety of social roles which changed over time.

The pots of others: the development of LBK ceramics

At the risk of oversimplifying a complex picture, the most important difference is between the earliest phase and later developments. Earliest LBK pottery is relatively thick-walled, frequently organically tempered, and if decorated at all bears very simple motifs, such as single spirals (Cladders 2001; Cladders and Stäuble 2003; Pechtl 2015; Quitta 1960). Initially described as uniform over the entire area of its distribution, recent research has begun to identify subtle regional distinctions in preferred motifs (Lenneis 2004; 2005; Strien 2009), while at the site level, some motifs seem restricted to specific buildings (Pechtl 2009, 36). However, the low frequency and simplicity of decoration mean that the potential of these vessels to be implicated in the definition of identity groups at various scales is relatively reduced when compared to later phases. This uniformity in make and decoration has been interpreted as direct supervision and control by elders (Frirdich 1994, 354–359; Sommer 2001). For them, status was founded on long-distance contacts with other Earliest LBK enclaves, thin on the ground during initial colonization, and on sponsoring the territorial expansion of the younger generation (Frirdich 2005, 99–103). Pottery here works as an identity badge for a grouping we can best describe as ethnic, defined by relatively close contacts of in-group members. Although not exotic, pottery is one of the elements in the glue holding the Earliest LBK together, and its widespread similarity is a key factor, providing a limited set of behavioural cues and messages that allowed even comparative strangers to negotiate on the same terms.

Particularly after the transitional Flomborn/Early *Notenkopf* horizon, however, decoration diversifies (Pavúk 2005; Pechtl 2015). Fine ware is now thin-walled and organic temper has been largely abandoned. There is also a shift in vessel shape towards more closed forms, maximising the surface available for decoration on the outside of the vessel. Banded motifs become more elaborate and can be complemented by rim motifs, various fillers such as dots, secondary motifs (so-called *Zwickel*), and vertical bands (Pechtl 2015) (Fig. 8.4).

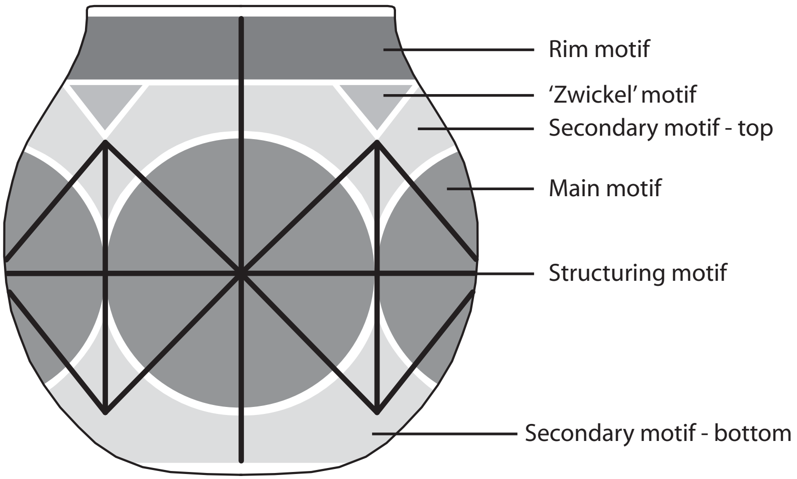

Fig. 8.4 Schematic structure of Later LBK pottery decoration (from Pechtl 2015, 558, fig. 29.2; reproduced with kind permission of J. Pechtl).

This increased elaboration brings new possibilities for creative divergence, perhaps most evident in the increased variety of regional styles, but actually played out over a range of scales. To pick just one example, at one level a north-western pottery style, current along the Rhine–Moselle confluence and the Meuse, can be distinguished from a south-western style found in Upper Alsace, the Hegau, and the Paris Basin (Lefranc 2007, 27). Sometimes such regional boundaries are sharply delimited, for instance in the case of Upper and Lower Alsace (Lefranc 2007, 26–30), at other times boundaries are fuzzier and decorative preferences can shift repeatedly (e.g. Lehmann 2004, 46). Within sites, groups of households can be linked by preferences for particular rim or body motifs (e.g. Frirdich 1994, 243–256). At an even smaller scale, the secondary *Zwickel* motifs may be the marks of individual potters, shifting as women migrate between Merzbach valley households in successive generations (Krahn 2003). In these later phases, then, pottery could be used to selectively draw connections and boundaries, and as shifts in "stylistic allegiances" show, this potential was actively made use of. Also, isolated vessels did end up travelling widely. Hungarian Keszthely-style ceramics are distributed up to 100 km to the north-west into Austria (Lenneis 2003), and beyond the LBK distribution an Alsatian LBK pot was found in a Cardial context at the Le Brezet rock shelter near Clermont-Ferrand (Jeunesse and Van Willigen 2010).

LBK ceramics thus functioned in a variety of ways, and alongside routine use there appears to have been an element of deliberate display and a role in exchange relations. The flipside of this "connective" capacity are the more explicitly "divisive" tendencies which marked out certain regions, sites, households, or individuals from each other. This same general trend towards increased diversification is also evident in other aspects of Late LBK material culture, for instance houses and cemeteries. This is occasionally argued to have been introduced from the outside, by creative foragers (e.g. Jeunesse 2008, 141–148; 2009, 165), or to relate to a cultural crisis. For pottery, several scholars cite a kind of social malaise during which potters had forgotten the significance of traditional motifs and became increasingly "confused" about the correct design structure (e.g. Constantin 2009; Pavlů 2000, 284). In my view, a third interpretative possibility must be borne in mind. This is the idea that pottery was an active medium in social negotiations and explicitly valued as such. Consequently, it also changed in response to new contexts in which it was deployed. What we must now seek to understand is how two complex and multifaceted, but distinct, pottery styles—LBK pottery and various non-LBK wares—could have interacted in their specific historical contact situation (Kienlin 2006).

Common ground

Looking at the trajectory of development of both pottery styles concurrently (Fig. 8.5), we can begin to suggest reasons for the diverging fate of La Hoguette pottery east and west of the Rhine. In Earliest LBK times, LBK pottery already had some limited capacity to create and perpetuate intra-LBK boundaries, as far as current research suggests mostly at the regional and household scale. However, its dominant characteristic compared to later phases is its widespread similarity. In this way, it could function as an identity token stressing the long-distance links that connected the far-flung diaspora communities of initial Earliest LBK expansion. La Hoguette pottery, initially most likely a hunter-gatherer ceramic, similarly stressed far-reaching connections, but apparently gained part of its social value by being a rare and exotic token, valued perhaps for its difference from everyday material culture. It transcended, rather than reinforced, group boundaries, although it, too, did not travel indiscriminately in all directions (for instance being absent from most of Bavaria; Fischer *et al.* 2009). In such a situation, we can envisage that those makers of La Hoguette pottery who had decided to join LBK communities were under pressure to conform. The Earliest LBK provided new social settings and connections that could be cemented by the use of pottery as a marker of sameness and belonging at an inter-regional scale, but not in a way that could easily be exported piecemeal.

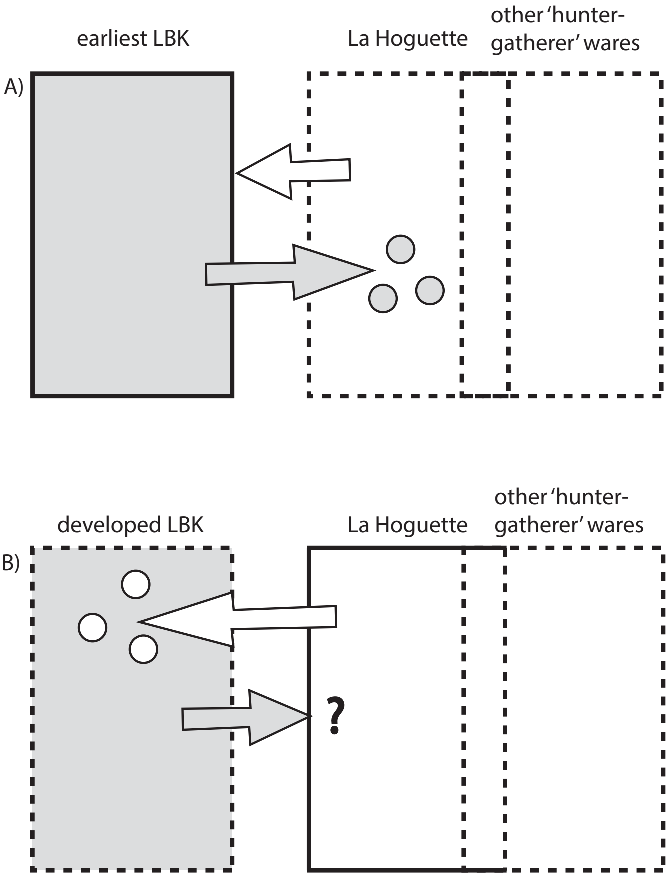

Fig. 8.5 Comparison of historical trajectories of La Hoguette and LBK wares, showing permeability and mutual influencing of pottery traditions. A) Situation in the Earliest LBK; B) Situation in the developed LBK.

In contrast, the long survival of the same kinds of non-LBK pottery in more westerly LBK areas coincides with a time during which LBK ceramics had diversified substantially. Their potential for creating and transcending boundaries at various scales had grown exponentially.

Elaborately decorated vessels could have served as status indicators and some pottery was exchanged over longer distances. This opened new possibilities for non-LBK vessels to be integrated, but it would be hasty to still refer to such items as "hunter-gatherer wares" *sensu stricto*. They could have been made by hunter-gatherer groups surviving between or beyond areas settled by the LBK, or by people who had settled in LBK communities, lived in new kinds of houses, and had adopted new sorts of economic strategies. Indeed, both these situations may well have coexisted, and this makes it difficult to appreciate the roles non-LBK pottery could have played. At one level, that it continued to be made, and in ever more diverse styles, implies a desire to create distinctions, now played out in a context that was more permissive than the Earliest LBK had been. At the same time, kinds of pottery with a long pedigree for creating far-flung links complemented or cross-cut regions defined on the basis of LBK ware. For Constantin (1985, 140), Limburg ceramics are one of the few things the RRBP definitely holds in common with areas further to the east, while the use of La Hoguette pots across Alsace contrasts with the increasing split between the Upper and Lower Alsatian LBK visible across a range of practices.

In these settings, the original ethnic connotations of non-LBK vessels may have become less important than the way they could function as an alternative to other styles, and at different sorts of levels (individual distinction, household tradition, clan membership, and so on). Perhaps this is the way to interpret the greater technological and stylistic borrowings that were taking place. The very different clay recipes and technology of La Hoguette, Limburg, and similar groupings would have continued to stand out. However, LBK pottery was itself becoming heterogeneous in terms of clay composition and tempers, whether between or within sites (see e.g. Böhm and Hagn 1988; Gomart 2010; Ramminger *et al.* 2010). Alternative ceramic styles offered a possibility of enhancing this trend, so that potters trained in an LBK tradition were willing to experiment, sometimes more so than their non-LBK-producing counterparts. With pottery now more flexible in its associations, there was room to maintain and even emulate alternative styles.

The above can form no more than a brief sketch of how things may have worked out. To assess the matter further, we need to give more sustained attention to the process of transmission. When discussing different styles, we have often not been comparing like with like. Similarities to Mediterranean traditions, and links and differences between the various groups of non-LBK pottery, are variously argued on the basis of single motifs, of more abstract structuring principles of the decoration (e.g. a preference for vertical panels), or on the basis of technological aspects such as temper. There has been no discussion of how such different elements could be transmitted, and whether this involved the same processes and routes. Learning to make pottery, for instance, would require more explicit instruction than simply replicating a new motif. We urgently need more in-depth study of *chaînes opératoires* to build up site-based and regional maps of the distribution and potential lines of transmission of motor habits, technological traits, and decoration choices. Most particularly, we must also take gender relations into account. In spite of a dominant trend of patrilocality in the LBK (Hedges *et al*. 2013), female products were valued as tokens of identity and were at some times subject to much greater control than items such as flint, where technological admixture is more evident (e.g. Allard 2005; Crombé 2010; Gronenborn 1997).

In sum, it is clear that the role of the active agent in these processes of cultural fusion can no longer be accorded exclusively to either one of the participants. Instead, both LBK and various non-LBK ceramics were flexibly implicated in a range of social concerns, from drawing boundaries to establishing connections, from gender relations to household competition and regional self-definition. To appreciate this dynamism, we must pair our attention to the pots themselves with a clearer focus on their context of use, bearing in mind that this was open to change. A straightforward role as an indicator for a bounded ethnic group was almost certainly not the only function of either tradition over the several centuries of their existence. In this sense, the disappearance of non-LBK ceramics at the end of the LBK is just as worthwhile of attention as their differential persistence in earlier phases and coincides with the drawing of new—possibly ethnic—boundaries which La Hoguette, Limburg, and associated styles could no longer reflect. But this is a different story.

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Notes

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[1] Throughout this text, Lüning's (1996) classification scheme is used. "Earliest LBK" thus does not refer to various formative phenomena in western Hungary and adjacent regions, but to the horizon of flat-based, organic tempered pottery that spreads out of these core areas.

[2] In this article, I have relied on the published identifications of excavators and pottery specialists when assigning particular vessels to "La Hoguette", "Limburg" and so on. This is problematic, as the definitions of different authors do not exactly coincide and all these labels hide considerable internal diversity, as well as overlaps between them (Kirschneck in prep.). However, this rather supports than invalidates my main conclusions.

[3] The term *Begleitkeramik* has recently been criticised as too vague (Gomart and Burnez-Lanotte 2012), but will be used here as it is well established in the literature.

[4] Gronenborn (2014) and Jeunesse (2001) have argued that La Hoguette and Limburg broadly coincide with the preferred lateralization of arrowheads, but this only works at a relatively coarse spatial scale. As Hauzeur (2009, 177) stresses, this is not a matter of exclusive practice, but merely of relative frequencies (see also Robinson *et al*. 2010).

[5] This diversity would probably further increase if more exhaustive descriptions were provided. Unfortunately, there is still a tendency to simply label all non-LBK pottery as belonging to an already established grouping such as La Hoguette (Kirschneck in prep.).

[6] All dates are informally inspected. Statistical modelling has not been carried out so far.

[7] It is often argued that taphonomic factors have skewed the distribution of this crumbly pottery, which simply survived better in LBK pits or under rock shelters (e.g. Brounen and Hauzeur 2010, 56; Lüning *et al*. 1989, 384). This has been criticized by Crombé (2009, 481), who points out that the assemblages from such "favourable" contexts are no larger or better preserved than those from open air sites.

[8] This is comparable to the situation in the Lower Rhine Area (Amkreutz 2013, 332f.).

[9] The Earliest LBK is conventionally quoted as starting around 5500 cal BC or earlier (Lüning 2011, 11), but in the light of current evidence, this claim is no longer tenable without additional verification. Several sites with typologically "earliest" LBK pottery have returned dates around or even after 5300 cal BC, the traditional end point of the Earliest LBK (this is the case at the cemeteries of Vedrovice and Kleinhadersdorf, but also for the Rottenburg–Fröbelweg and Niederhummel settlements, where short-life and well-stratified material was

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chosen; Bofinger 2005, 112–127; Hofmann 2011, 59; Neugebauer-Maresch and Lenneis 2013; Pettitt and Hedges 2008). The basis on which the dating of the Earliest LBK is founded has indeed long been critiqued as over-reliant on poorly contextualised and/or long-lived samples (Stäuble 1995; 2005). Few very early dates remain, notably that from Schwanfeld (Lüning 2011), which is not enough in itself to justify a very early date for the Earliest LBK in Germany and adjacent regions as a whole, particularly in relation to the situation in Transdanubia (Bánffy and Oross 2010, 262–264). Clearly, this whole issue will need to be revisited with the necessary care.

[10] Limburg pottery from Cuiry-lès-Chaudardes will be investigated as part of the Neo Milk project at Bristol University (Richard Evershed pers. comm.) and ideally, a study focusing specifically on different kinds of non-LBK wares would follow.

BURIAL EVIDENCE AND RITUAL DEPOSITION

CHAPTER NINE

THE LBK RITUAL–BURIAL COMPLEX FROM NEZVIS'KO, WESTERN UKRAINE

MACIEJ DĘBIEC

Introduction

In the eastern range of the LBK, graves have been only rarely discovered. For the Polish areas where settlements of this culture are well recognized, we know only one cemetery with 36 cremation burials (Czekaj-Zastawny and Przybyła 2012), as well as 17 other sites mainly with individual graves (Czekaj-Zastawny 2009). The further we move to the east, the fewer burials are known: the territory of Ukraine has provided three graves (Dębiec 2012), while Moldova and Romania have none at all.

Speaking of the burials from Ukraine, the most interesting is undoubtedly the grave discovered in the village of Nezvis'ko, which will be analysed in detail in this paper.

The site of Nezvis'ko

Nezvis'ko is a small village in western Ukraine in the province of Ivano-Frankovsk. The site is located on the bank of the Dniester River. At that point, the river forms a canyon and a sizable meander and the banks (in particular the right one) rise steeply tens of metres above the water surface (Fig. 9.1). In the place where the LBK site has been discovered, the right steep bank of the river is split by a deep and narrow valley formed by the small river Čortovec', which flows into the Dniester here. The site is located on the first narrow terrace above the floodplain, which rises only a few metres above the water level. It was formed due to the accumulation of alluvial material of the river. This terrace is limited by the river on one side and by the steep slope of the higher terrace, which lies some tens of metres higher, on the other. Today, the entire area of the floodplain and the first terrace are periodically inundated in the course of

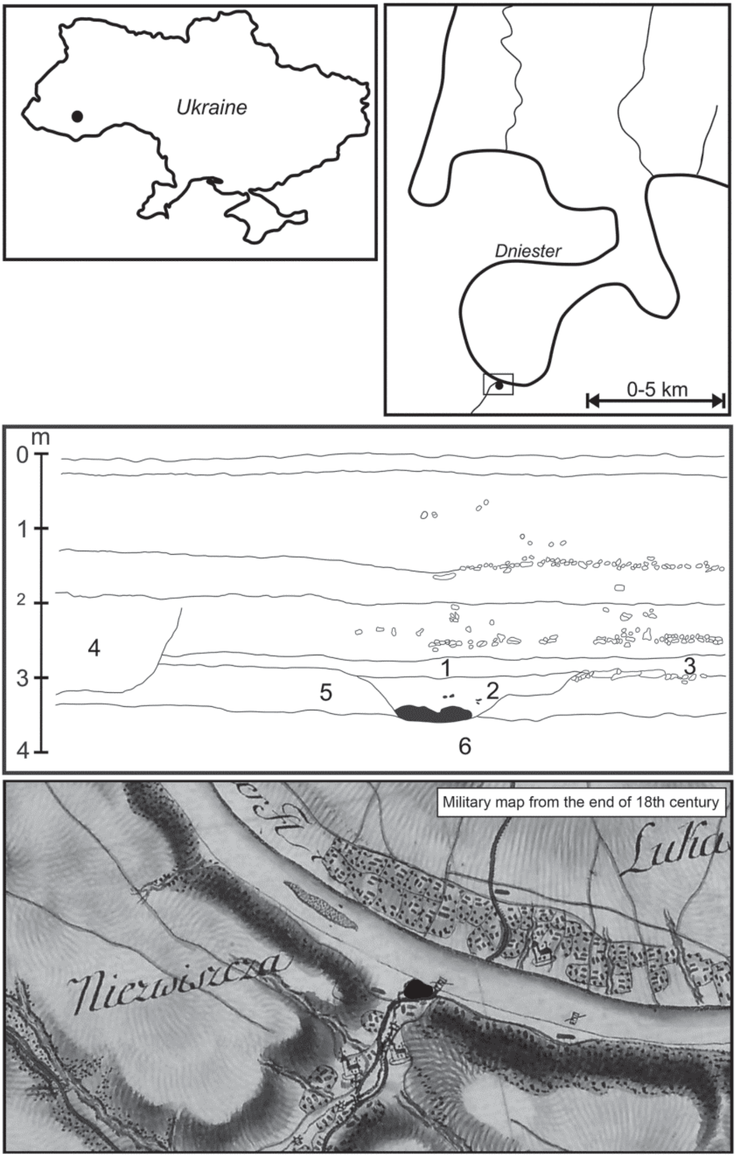

Fig. 9.1 Nezvis'ko, Western Ukraine. Location of site and stratigraphy (1 – LBK layer, 2 – LBK pit, 3 – LBK stone platform, 4 – Trypillia pit, 5 – natural river alluvium, 6 – limestone bedrock). Military map from http://mapire.eu/en/earth/collection/firstsurvey/

severe floods of the Dniester. This should explain the considerable thickness of sediments uncovered during excavations and the layered sediment structure which occurred because of accumulation by water. Floods in prehistory used to deposit a large amount of river material, which covered the remains of an older settlement. Therefore, it was not destroyed by later human activities. The thickness of archaeological layers recorded in the course of excavations amounted to more than 250 cm.

The site was discovered in the 1920s by K. Hadaczek (L. Kozłowski 1930, 206). First excavations were carried out in 1926 under the direction of L. Kozłowski, R.W. Hutchinson and J.P. Preston (Hutchinson and Preston 1930). In the years 1951–1957 the site was excavated once more under the guidance of a number of researchers, including K.K. Černiš, O.K. Černiš, G.I. Smirnov, M. Śmiszko and O. Ratič (Černiš 1962). They investigated more than 900 m² of the site. Overall, ten chronological phases were identified at Nezvis'ko, with the oldest finds belonging to the LBK and the youngest ones to the Middle Ages.

Description of the grave

In 1953, researchers discovered an LBK grave at a depth of approximately 2.15 m from the ground surface. The outline of the burial pit was not recognized and the dimensions of the grave were based on the arrangement of the body, the extent of burnt ground, and the location of grave goods (Fig. 9.2). It occupied an area of about 4 m^2 (2.5 by 1.6 m). If the corpse was situated at the same level as the other elements of the complex discovered at Nezvis'ko (described below), it can be assumed that no burial pit was ever dug in this case. The body was probably deposited on the ground surface or in a shallow hollow and then covered with some kind of permanent structure that protected both the skeleton and grave goods and preserved them *in situ*. At the beginning of the burial ceremony, the entire area of the grave was exposed to fire. Then, at the same place, the corpse was partially cremated. Evidence that this procedure was carried out on the burial site could be the ash recorded in the course of excavation and the anatomical arrangement of the remains.

Despite the fact that the body of the deceased was partially burnt, the skeleton was preserved in a fairly good condition. The long bones of the limbs, the bones of the skull and a part of the small bones were not much burnt, so it was possible to reconstruct the arrangement of the body. The deceased was placed on the left side and the head was directed towards the north-west. One leg was laid out in a straight line and the hands were bent in front of the face. The preserved arrangement of the leg bones suggests that one of them could have been bent at the knee. Grave goods were arranged at various locations around the corpse, with the largest concentration in the western part of the grave, near the back of the body. Some of the vessels were placed on a clay platform built close to the deceased, on the left side.

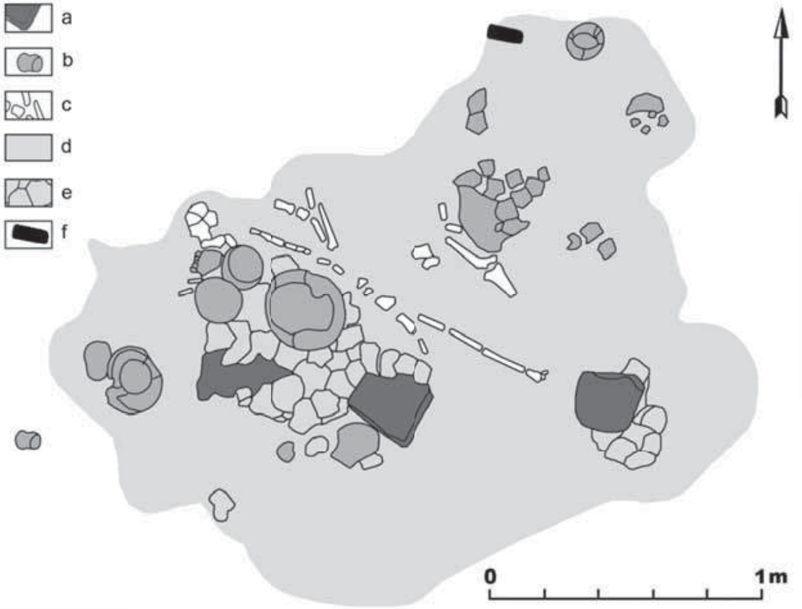

Fig. 9.2 Plan of the grave at Nezvis'ko. a: stones; b: vessels; c: human bone; d: burnt surface; e: clay platform; f: shoe-last adze. After Passek and Černiš 1963, fig. 7.

The burial inventory consisted of, amongst others, 18 vessels, including 14 items preserved completely or in large fragments (Fig. 9.3). Twelve vessels had incised decoration, often with Music Note ornaments. One of the vessels had an incised ornament which created a kind of pictogram composed of four distinct signs (Fig. 9.3, 4). The other four vessels were decorated with fingertip impressions, which in two cases formed complex compositions (Fig. 9.3, 5–6). Plastic ornaments in the form of knobs were observed on two vessels (one of them combining this decoration with finger impressions). One item was decorated with red paint. Regarding the shapes of the pottery, hemispherical vessels (mainly ¾ or ½ of a sphere)

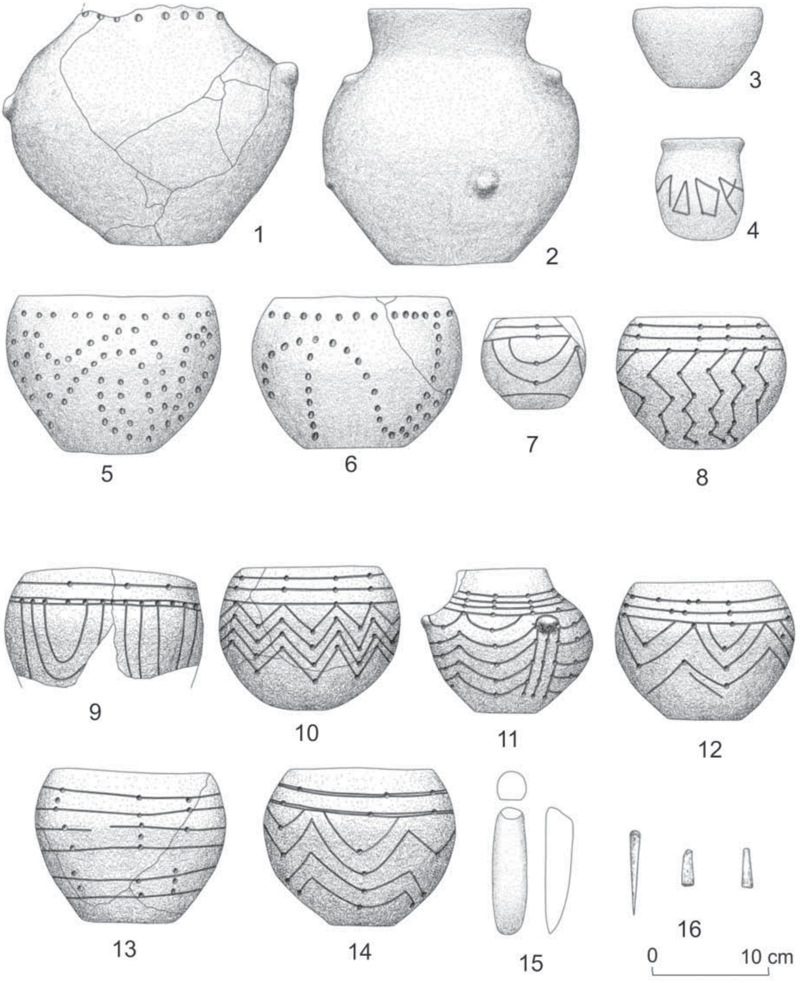

Fig. 9.3 Vessels (1–14), shoe-last adze (15), and bone tools (16) from the Nezvis’ko grave. After Passek and Černiš 1963, plate VIII.

dominated (Fig. 9.3, 5–10, 12–14). In addition, the grave inventory included closed vessel forms with a separate neck (Fig. 9.3, 2, 11), one bowl (Fig. 9.3, 3) and one form with a poorly differentiated base and a slight narrowing under the rim (Fig. 9.3, 4). Moreover, two vessels contained plant remains: wheat, spelt, and peas. Apart from ceramics, there were three burnt bone artefacts, including an awl (Fig. 9.3, 16), and a burnt stone shoe-last adze (Fig. 9.3, 15). Several large pieces of limestone were also discovered inside the grave. On the basis of vessel ornamentation, the burial from Nezvis'ko can be assigned to the Music Note phase of the LBK (Dębiec 2012).

Complex of features associated with the grave

About 2 m to the west of the aforementioned grave there was a complex of features consisting of several components discovered at the same level. Its dimensions were 19.5 by 9 m. It was oriented in a north–south line and occupied a total area of about 80 m^2 (Fig. 9.4). Beginning on the south side of the complex, it consisted of the following elements:

A) In the southern part, there was a feature 4.2 by 3.2 m in extent and about 50 cm deep. Inside the feature, the researchers found a section about 20 cm deeper than the rest, a small pit filled with ash and charcoal. The fill contained fragments of pottery (including a piece of pottery with plastically shaped animal horns), bones of animals (cattle, pig, sheep/goat, dog, horse), flint artefacts (including cores, flakes, and scrapers), and a fragment of a shoe-last adze.

B) In the south-western part, there was an *in situ* deposit of 10 perforated clay loom weights (Fig. 9.5, 6–7). They were arranged in two rows directly on the subsoil.

C) The longitudinal layer of burnt soil and ash, stretching from the south to the north, with a few natural limestone rocks forming a cluster in the southern part.

D) To the west of the burnt area and parallel to it there was a longitudinal layer about 8 m long and 3–4 m wide, which contained numerous pottery sherds (Fig. 9.5, 1–5, 10–11). There were at least 56 pieces; some of them could be reconstructed into whole vessels. Perforated sherds from so-called sieve vessels were identified, and two sherds had traces of red ochre on their inside surfaces. Apart from ceramics, an antler axe (Fig. 9.5, 8) and antler rough-outs needed for the preparation of further axes, as well as a zoomorphic figure (Fig. 9.5, 9) and a few flint items, were also discovered. Moreover, at the western edge of the described accumulation of artefacts, traces of two posts (one in the northern part and the second one in the southern part of the feature) were recorded.

E) A rectangular clay platform located east of the layer of burnt soil. Its dimensions were 2.2 by 1.1 m. The thickness of the platform was about 10–15 cm. It was built directly on the subsoil.

F) Another clay platform was about 1 m to the north of the one described above. Its dimensions were 1.5 by 1.1 m. Its thickness was about 10–15 cm. It was built on a stone foundation.

G) A clay platform, located in the northern part of the whole complex. Its dimensions were 2.2 by 2.2 m and it was made of rolls of clay and constructed on a wooden structure, whose burnt remains were very well preserved. The platform was designed so that its clay edges were slightly raised in relation to the centre, thereby reducing the area and forming a closed internal space. Moreover, there were quernstones found *in situ* on its surface. In close vicinity to the structure there were also a vessel and some flint artefacts.

H) An assemblage of at least nine flint artefacts, including two cores, blades and retouched flakes, a sickle blade with gloss, and endscrapers. They were next to the clay platform with quernstones.

I) A feature in the north-eastern part, in the immediate vicinity of the grave. It had an oval shape with a diameter of about 0.8 m and its fill contained a few fragments of pottery and flint items.

J) In addition to the above-mentioned two postholes, two more were observed, one in the southern part, and the other within the complex between the pottery layer and the layer of burnt soil.

It should be emphasized that the whole complex associated with the discussed grave was preserved *in situ*. This unique situation is probably the result of accumulation caused by the Dniester River, which in the course of subsequent flooding deposited large amounts of water-borne material. This is likely to have happened soon after abandonment, as the artefacts recovered from the site do not seem rolled or abraded. Therefore, at the time settlers of the Eneolithic and later periods started to use the area originally occupied by the LBK, it was already covered with a thick layer of alluvium.

Existing interpretations regarding the burial within the complex at Nezvis'ko and their critical review

In earlier literature, researchers devoted very little attention to the finds from Nezvis'ko. They published the results presenting them as remains of a LBK dwelling with a neighbouring burial. The residential building was interpreted as a construction of the so-called ploshchadka type[1], which is typical for the Cucuteni-Trypillia area (Passek and Černiš 1963). J.K. Kozłowski suggested that the impulse for the construction of this type of dwellings by LBK communities could also come from the Szakálhát group

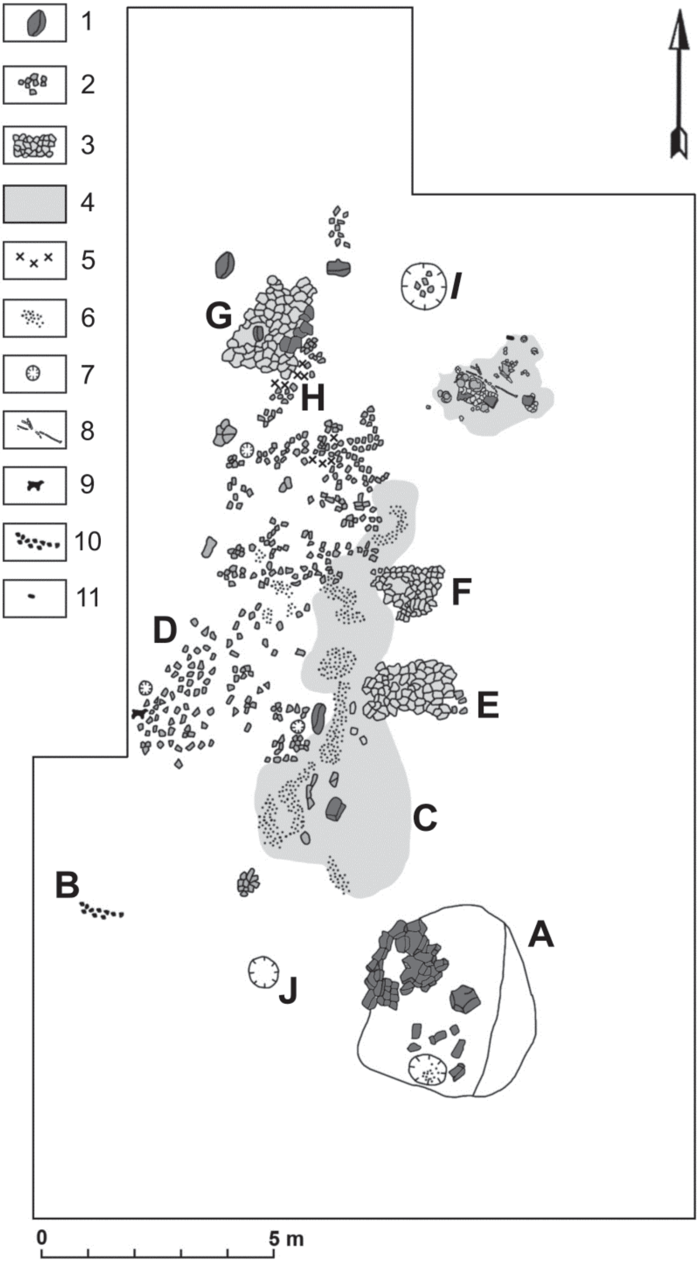
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Fig. 9.4 (left) The ritual–burial complex at Nezvis’ko. Key: 1 – stones, 2 – pottery, 3 – clay platforms, 4 – burnt ground, 5 – flint, 6 – ashes, 7 – postholes, 8 – human bones, 9 – zoomorphic figurine, 10 – loom weights, 11 – shoe-last adze. The zonation (shown as letters) is explained in the text. After Passek and Černiš 1963, fig. 7.

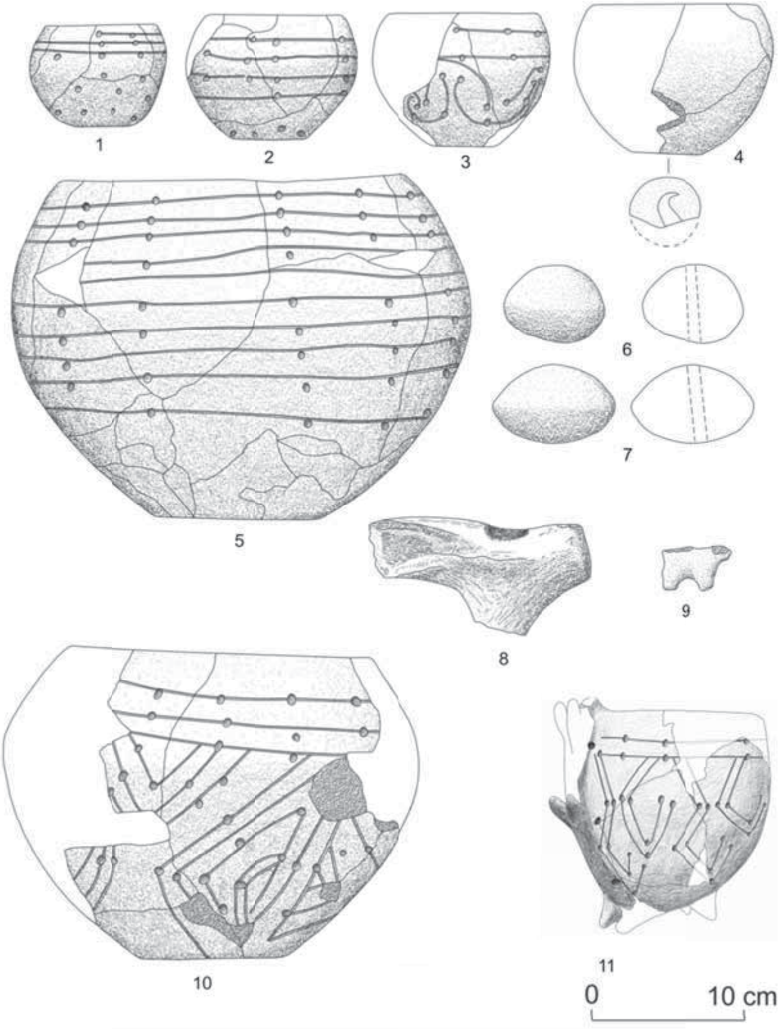

Fig. 9.5 Artefacts from zone 4 in Nezvis'ko. After Passek and Černiš 1963, plate II.

or from the earliest phases of the Precucuteni culture (J.K. Kozłowski 1985, 66).

However, the interpretation of the complex in Nezvis'ko as a LBK dwelling is questionable for several reasons. To begin with, the construction of a LBK house was one of the most determining characteristics of this culture and thus was the subject of little change, despite its wide range from the Paris Basin in the west to Odessa in the east. Chronological development did not cause a radical change in the way of building, and the observed differences were minor (e.g. the orientation, the presence of loam pits, size or interior arrangement). In the eastern part of LBK, too, we recorded constructions which follow the patterns observed in better researched areas and there are no indicators for regionally divergent styles of architecture in Poland and Ukraine (Dębiec 2012; 2014).

The impossibility of building a typical LBK house, with its multitude of posts, is also indicated by the fact that the depth of the soil here is insufficient for the erection of posts. It is assumed that the posts ought to be sunk into the ground to a depth of at least 1.5 m (Lüning 2011, plate 17) to ensure the stability and safety of the structure. In the area in which the LBK remains were discovered, the depth of the soil above the rock was only about 70 cm in LBK times. Postholes would hence have to have been cut into the rock, but this was not observed here. The postholes near the grave show that if such features had existed elsewhere on the site, they would have been recognized. Also, during the excavation at Nezvis'ko, researchers did not discover any accumulations of daub which could be interpreted as the remains of a collapsed house, i.e. a ploshchadka; the clay platforms discovered near the burial are too small for this kind of interpretation to hold. There were also none of the loam pits which are typical for an average LBK house.

Furthermore, there is no evidence of LBK contacts with the Cucuteni-Trypillian culture. This was the time when the Precucuteni culture had just formed in the area of modern-day Romania and Moldova, and the western areas of Ukraine were not settled yet. What is more, the pottery discovered in Nezvis'ko did not show evidence of contacts with the Transcarpathian area and the Szakálhát culture. Finally, the immediate surroundings of the site in Nezvis'ko were not a favourable location for a LBK settlement. The land suitable for growing crops and grazing animals is very limited and not sufficient to feed even a small population of early farmers.

In sum, the original reading of the evidence is not satisfactory. The present paper intends to provide a different interpretation of the grave and the accompanying complex.

An attempt at a new interpretation of the grave and associated remains discovered in Nezvis'ko

Significance of the place of burial

The burial and the accompanying complex were located in a specially selected place that was difficult to reach. The territory around Nezvis'ko is near the Dniester canyon, where the meandering river creates a nearly closed oxbow lake. The high and steep edges of the upper terrace impede access to the burial place, creating a kind of closed and isolated zone which could only be reached via the valley of the Čortovec'. The choice of the place must have had significance for those preparing the burial. At the same time, the location of this complex does not conform to any of the three basic location models of burials with regard to a settlement (Czekaj-Zastawny 2009, 28; Jeunesse 1997, 43–44), which are: proper cemeteries, isolated burials in settlements, and small clusters of graves within the settlements or on their outskirts.

Zones within the complex

The complex discovered in Nezvis'ko is made up of many different components, which are grouped into fairly clear zones. Each of these zones will be analysed separately, to finally provide a complete interpretation of the whole complex (Fig. 9.4 and Fig. 9.6).

Zone 1 (G and H) comprises the clay platform on a wooden foundation. Quernstones and grinders were located on it, which indicates that it was a place for the initial treatment of plant foods. The wide-mouthed vessel, found in its vicinity, could serve as a container in which grain was stored, either prepared or in their pre-processed form. The intentionally raised platform edges facilitate the work with, for example, grain and prevent its excessive spillage. Moreover, in the vicinity of the platform a cluster of flint artefacts was recorded, which included cores, preforms, and tools with traces of heavy usage. At least some of them can be linked directly to crop cultivation and plant processing. The flint inventory represents the entire *chaîne opératoire*, from the core, via the preform, and up to the used tool.

Zone 2 (E and F) consists of the two clay platforms located in the eastern part of the complex, next to the zone burnt by fire. No artefacts were found in association with them. Probably they served as a place for the next stage of preparing food, which then was thermally treated at the immediately adjacent fire.

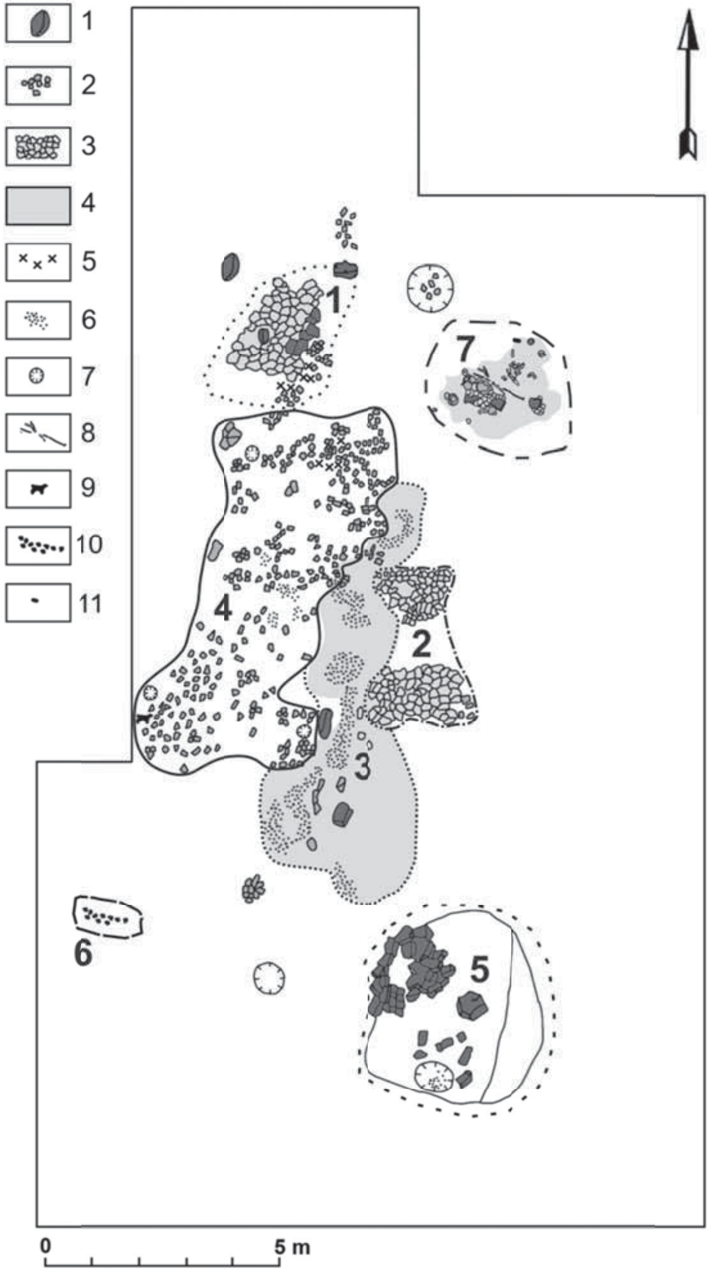
1
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Fig. 9.6 (left) The zones of the Nezvis’ko complex. Key: 1 – stones, 2 – pottery, 3 – clay platforms, 4 – burnt ground, 5 – flint, 6 – ashes, 7 – postholes, 8 – human bones, 9 – zoomorphic figurine, 10 – loom weights, 11 – shoe-last adze. (Numbers on the plan itself are explained in the text). After Passek and Černiš 1963, fig. 7.

Zone 3 (C) is an elongated area of heat-affected ground and traces of fires, bordered on the west side by the zone with accumulations of pottery sherds (zone 4), and on the east side by the two clay platforms making up zone 2. In this zone, there were no artefacts. However, the excavators noticed large accumulations of ash and a few fragments of natural limestone, which could serve as building blocks for the construction of hearths. It was hence probably the place where the food previously prepared on the clay platforms was cooked. The discovery of animal bones exclusively at another location, in the hearth inside the sunken feature (zone 5), indicates that quite possibly only foods of plant origin were prepared in zone 3.

Zone 4 (D) is the largest one in the whole complex at Nezvis'ko. Its main characteristic is the extremely high number of pottery sherds found here. In addition to the pottery there were one zoomorphic clay figurine, a few flint artefacts collected in one place, an antler axe, and some rough-outs for the production of further axes. The axe could have been used as a weapon or a symbol of prestige, or possibly simply as an everyday tool used in the course of farming work. As mentioned above, the pottery includes fragments of sieve vessels and ones with traces of ochre. A unique zoomorphic vessel is richly decorated with incised lines and music notes (Fig. 9.5, 11). This zone was created in the course of the intentional destruction and breakage of a large amount of pottery vessels (at least a few dozen) and the deposition of other items. Overall, these items were related to the plant and animal world and the processing of materials from it.

Zone 5 (A) is made up of a pit of significant size located in the southern part of the complex. It included an additional fireplace at the base of the pit, and it was filled with ash and the remains of animal bones. What is more, on the edge of the pit there was a platform built with locally occurring flat limestone slabs. So it was most likely a place connected with the processing and preparation of food of animal origin.

Zone 6 (B) consists of a cluster of ten clay loom weights arranged *in situ* in two rows in the south-western part, at a certain distance from the rest of the complex (about 3 m). The first row has seven, and the second row three items. It is difficult to determine whether the loom which once stood here served to weave fleece or materials of plant origin.

Zone 7 is the grave itself. Its preparation began with burning the entire area, perhaps a kind of symbolic cleaning by means of fire. Then the deceased was placed on the ground and subjected to partial cremation. So far, this type of behaviour has not been observed for the LBK, but such practices are known from megalithic graves in Ireland (Kruk 2006, 11). Most likely, the deceased was already surrounded by at least part of the burial inventory. All preserved bones were discovered in anatomical order. After completion of the activities related to cremation, more grave goods were added in the form of vessels, at least some of which were filled with plant-based food. Some of the vessels were set on a specially prepared clay platform built next to the deceased. The burial also included flat limestone slabs, which were probably used to build a structure sealing the grave. The existence of such grave protection is indirectly indicated by the preservation of the skeleton and the associated burial goods in an undisturbed arrangement, despite subsequent taphonomic processes (notably river floods). Due to the lack of an anthropological study, the sex of the deceased is unknown. However, the discovery of a shoe-last adze among the grave goods probably indicates an adult man (Nieszery 1995, 110).

An attempt to reconstruct the course of the burial ritual and the accompanying funeral ceremony

The construction of all the components of the complex required considerable labour and time, particularly pit digging, erecting the posts and the roof structure around the grave, as well as building the clay platforms. Probably, a large group of people was involved in this process; they may have been relatives of the deceased, or all the inhabitants of the village where he came from. Also, the transport of all the items deposited during the rituals required the involvement of a significant group of people. There were at least 70 pottery vessels alone, not to mention the heavy quernstones, grinders, and other items. Additionally, large flat limestone slabs were brought here (probably from the nearby steep slopes) to be used in the construction of part of the structure. Therefore, the funeral was specially planned, the space was carefully selected, and many people participated.

Preparation of the burial and funeral ceremony can be divided into several major phases. First, a burial place was purified by the use of fire. Then, after laying out the corpse it was subjected to partial cremation. The next step was to set vessels next to the deceased, at least some of which were filled with food of plant origin. The last phase was to build the structure sealing the grave. Most likely, some accompanying rituals took place at the same time in an area specially prepared for this purpose. In the northern part of the complex, plant food was initially prepared (zone 1) and finally processed in the hearths located in the middle part (zone 3), using the two clay platforms (zone 2). The food of animal origin was prepared in a separate place, in the hearth located inside the pit in the southern part (zone 5). Mainly the meat of domestic animals (cattle, pig, sheep/goat, dog) was used to prepare the meal and the only wild animal whose meat was processed was a horse. The vessels which were used during the rituals were then deliberately destroyed by breaking them near the place where the food was prepared earlier. Post-consumption, waste was separated according to the kind of material. All the animal bones found had been put back near one fireplace, separate from artefacts connected to plant processing. At the place where the pottery was broken, other items were also deposited, such as flint preforms and tools, an antler axe and antler rough-outs, an animal clay figurine, and a zoomorphic vessel. In the south-western part were the ten loom weights.

The analysis of all the remains leads to the conclusion that the main division expressed in this burial rite was associated with opposing plant and animal worlds. Such a division was strictly respected in the course of food preparation, and probably food consumption. We can assume that this division was also reflected in divisions within the community, for instance related to restrictions in who could consume which kinds of food. However, it is currently not possible to determine how these divisions were defined (e.g. sex, age, social position, and perhaps the degree of relationship with the deceased). The dead individual was also provided with food, as the vessels contained grain.

Destruction and deposition of items in Nezvis'ko

Furthermore, an interesting issue also concerns the intentional destruction and deposition of such a large number of objects, which were undoubtedly of great value for the people who destroyed them. This kind of behaviour could be linked to the potlatch custom (Mauss 2001, 169–173) which, as one component of an extensive and complex custom, includes the intentional destruction and distribution of goods. One of the results that could be achieved due to this type of action by a person, family, or group might have been to gain a higher status and/or an increase to the scope of their authority. So far, this type of behaviour has not yet been reported in relation to LBK communities.

The intentional destruction of property in the case of Nezvis'ko can be interpreted in several ways. It could emphasize the importance of the deceased, reflecting his social status. Alternatively, this could be the destruction of property belonging to him or his family. Finally, such behaviour could be the result of competition between the individuals or families participating in the rites, and who either wished to raise their own status or to ensure that the authority and position of the deceased were passed on to them.

The status of the person buried in Nezvis'ko in the LBK community

Undoubtedly, the person who was buried in Nezvis'ko had a significant position in the community of early farmers. This is indicated by the selection of valuable gifts deposited with the deceased (it is the largest collection in terms of number of vessels deposited as grave goods within the entire LBK), the treatment of the body, the grave structure, the construction of the entire complex only in order to conduct the rituals associated with the burial, and the spatial autonomy of the burial complex located outside of any settlement, as well as the scale of consumption. With respect to preparing and carrying out the ceremony, a large and well-organized group of people must have been involved.

The burial from Nezvis'ko could thus support the idea that during the middle phases of the LBK (including the Music Note phase), a gradual process of differentiation of the (so far) egalitarian communities of farmers took place (Czekaj-Zastawny 2004, 180).

Conclusion

The analysis of the grave and associated remains uncovered at Nezvis'ko allows us to formulate some general comments and proposals concerning not only the burial rites, but also the social relations within LBK communities. Nezvis'ko is a unique situation, where owing to the accumulation of river deposits the original ground surface was preserved, and all the artefacts (not only from the grave) can be considered as found *in situ*. This is an extraordinary stroke of luck, as it is assumed that in general, erosion could have removed as much as 1.5–2 m of soil on most LBK sites, thereby destroying the original walking surface (Schalich 1988, 23). In addition, this is the richest burial in terms of ceramic inventory within the LBK as a whole.

So far, we have not found structures similar to those in Nezvis'ko, or the remains of similar rituals, elsewhere in the LBK. Constructions in the form of huts were recorded at a cemetery in Sondershausen, but there a grave was located in the centre of a posthole construction, which was regarded as a house of the dead, or *Totenhütte* in German (Kahlke 2004, 65–66). Moreover, there are also remains of individual posts relating to particular graves within the cemetery of Rixheim/Moulhouse Est (Peschel 1992, fig. 68). At Nezvis'ko, stone was also used for building the construction, which is unique in the whole LBK.

There was a very clear and strictly enforced separation of foods in terms of their origin (plants and animals), probably during food preparation and certainly during the disposal of post-consumption waste. A clear preference for food coming from the meat of domesticated animals, rather than wild ones, is also observed. It is difficult to determine unambiguously whether these divisions were also important in classifying people within the LBK community in terms of who could deal with, prepare, and consume certain kinds of food. Traditions concerning the avoidance or prohibition of certain kinds of food are also widespread today and are important in religious behaviour or in creating one's own distinctiveness and cultural identity.

All archaeological data obtained at the site indicate that the person buried at Nezvis'ko was very important and enjoyed a high social status. Evidence for depositing and destroying objects may also indicate a rivalry within the LBK community and an attempt to gain higher status by individuals or a group of people. This shows the changes in the social structure of the LBK in its middle phase.

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Notes

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[1] That is, a layer of burnt daub/clay, which forms the remains of a burnt house. These kinds of features are typical for the Cucuteni-Trypillia culture.

CHAPTER TEN

DIVERSITY IN RITUAL PRACTICE AT THE END OF THE LBK

ANDREA ZEEB-LANZ AND FABIAN HAACK

Special phenomena at the end of the LBK

Although the Linearbandkeramik culture (LBK), the first wide-spread agricultural system recognized in central Europe, can easily be identified due to the uniformity of material characteristics such as house plans, artefact styles, or burial traditions, there are strong individual traits indicating regional variations in the development of the culture. As P.J.R. Modderman has pointed out, these regional traits in the apparently uniform LBK can already be distinguished in its earliest phase (Modderman 1988, 130). A notable diversity is also present in the human skeletal remains from LBK burial grounds, even on a regional scale. Diversity is furthermore apparent regarding the latest large-scale analyses of strontium and other isotope values indicating differing ranges of migration, as well as differences in land access and land use preferences (Bickle and Whittle 2013). Nevertheless, the Bandkeramik shows a very homogeneous supra-regional habitus which grants the material culture an intuitive recognition value, providing a Europe-wide unitary picture of the cultural assets of the LBK.

The starting point for our subsequent considerations is the ritual site of Herxheim, which occupies a central place in our examination of extraordinary phenomena in the Youngest LBK. It is estimated that more than 1000 individuals were killed here during a special ritual and afterwards manipulated in a most unusual way (Boulestin *et al.* 2009; Zeeb-Lanz *et al.* 2007; 2009a; 2009b; 2013). In Herxheim we are confronted with an enormous number of people who are treated in a way not known in the admittedly wide variety of LBK burial traditions (Pechtl and Hofmann 2013). In this article we argue that the Herxheim dead do not belong to a stage within a burial ceremony, but reveal a ritual singular in its scale and which might—like the other examples quoted in this paper—be the result of new ideas which could be interpreted as a reaction to critical developments in the socio-cultural situation of the Late LBK (Zeeb-Lanz 2009, 96)[1]. Judging from the current state of research, there were not very many and no large Youngest LBK settlements in the Palatinate (Fetsch 2012; Häusler 2013), but it has been possible to define a regional pottery ornamentation style for this region (Jeunesse *et al.* 2009). The emergence of regional groups—clearly visible in the ceramic ornamentation of the latest phase of the LBK, but probably beginning earlier (Strien 2009)—hints at a new awareness of group identity (Zeeb-Lanz 2003) and possibly profound changes in the socio-cultural system. The transition of the LBK to subsequent cultural entities varies in the diverse regions of its existence; in the upper Elbe valley, for example, no real break between the LBK and the following Stichbandkeramik can be noted (Link 2014), whereas in the western parts of the LBK distribution more radical changes seem to occur, which some researchers even connect with warlike situations leading to cultural collapse (e.g. Farruggia 2002; Golitko and Keely 2007; in contrast: Zeeb-Lanz 2009).

Several publications have compared Herxheim with sites like Talheim (Baden-Württemberg, Germany) and Asparn/Schletz (Austria) and equated it to these violent scenarios of the Late Bandkeramik (e.g. Beyneix 2007, 89–93; Farruggia 2002, 29; Golitko and Keeley 2007, 335). However, the extraordinary situation at Herxheim has turned our attention to other unusual Late LBK phenomena, which can roughly be classified as:

1. inter-group conflicts
2. ritual manipulation of human bodies

Activities of these two kinds, presented in this paper, directly affect human individuals who are the focus of violent and/or ritually motivated actions. We will argue that these phenomena played a certain role in the sudden end of the Bandkeramik culture; as introduction to this discussion we begin by presenting selected examples for each group[2] (Fig. 10.1).

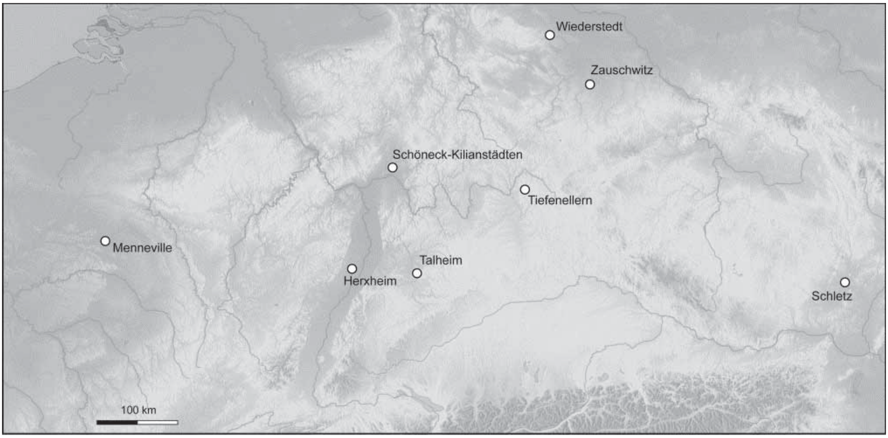

Fig. 10.1 Map showing the sites mentioned in the text.

Inter-group conflicts

Talheim near Heilbronn (Baden-Württemberg, Germany): mass grave

In 1983 a farmer discovered a Late Bandkeramik mass grave while installing a vegetable bed on his land. Subsequent rescue excavations in 1983 and 1984 revealed a pit of 3.00 by 1.30–1.50 m (Wahl 1985; Wahl and Trautmann 2012) containing at least 34 human individuals; scattered between the skeletal remains were undecorated and ornamented Bandkeramik pottery sherds, daub fragments, and animal bones (Fig. 10.2). The decoration of the pottery dates the grave to the Younger LBK (Biel 1987, 188). Two ^{14}C-analyses on human bone returned the dates 5960±80 and 6045±60 BP, giving a calibrated age for the feature of around 5000 cal BC (Wahl and König 1987, 68).

The anthropological examination of the human remains identified a minimum number of 34 dead individuals consisting of 16 children and adolescents and 18 adults, the latter comprising nine men, seven women, and two unsexed individuals (Wahl and König 1987, 181). Apart from the total absence of children under one year of age, the relation of children/adolescents to adults (47.1 % to 52.9 %) corresponds to the image of a complete small population (Wahl and König 1987, 75). The distribution of the age brackets of the Talheim community shows a high affinity to the hypothetical life pyramid (constructed after Gebühr and

Kunow 1976) for the Talheim mass grave (Wahl and König 1987, 76 fig. 8). In a recent study of the demography of Talheim, using computer simulations and comparison series, A. Düring and J. Wahl come to the conclusion that the dead from the mass grave most likely represent the whole living population of a settlement community (Düring and Wahl 2014). Although they differ in detail, both studies on epigenetic markers and on tooth markers suggest that a number of the Talheim individuals were related, constituting several kinship groups, although this must be confirmed further (Alt *et al.* 1995, 216; Wahl and König 1987, 94–99).

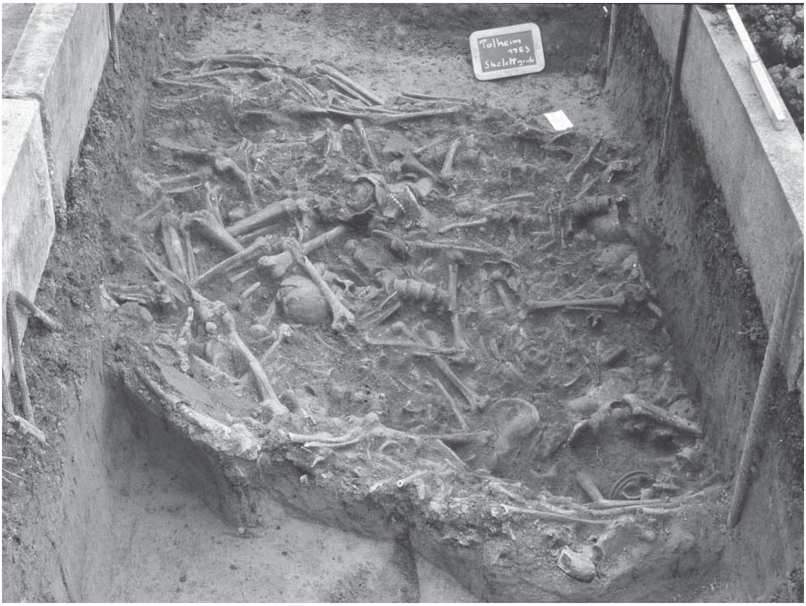

Fig. 10.2 Skeletal remains of the 34 individuals in the mass grave of Talheim near Heilbronn (Baden-Württemberg, Germany) Photo: E. Strauß, LAD Baden-Württemberg, RP Stuttgart.

Obviously the dead individuals do not represent the entire population of one Bandkeramik village extinguished by an epidemic—at least 18 individuals show unhealed wounds on the skull (Wahl and König 1987, 182), which are the likely cause of death. While there are few traumata on the face and the postcranial skeleton, lesions concentrate in the region of the right occipital. The few injuries on other parts of the body are signs of an impact from behind. The traumata on the occiput were caused by blows with adzes or unidentified blunt weapons; arrow injuries also occur, but in a restricted number. The researchers are unanimously of the opinion that Talheim is the place of an aggressive conflict with deadly outcome during which a Bandkeramik village was raided and all the inhabitants were slain, although not every individual in the mass grave had skeletal traces of deadly wounds. Either the aggressors, or possibly relatives who escaped the slaughter, are then said to have unceremoniously buried the dead without providing them with any grave goods (Wahl and Trautmann 2012). Partly they were laid, partly simply thrown into the quickly dug shallow pit (Wahl and König 1987, 184–185). As there are no traces of damage caused by animals on the bones, it can be deduced that the Talheim individuals were buried speedily shortly after having been killed. Following these observations, the mass grave of Talheim would represent an example of aggressive conflict with deadly effect for one side in the latest phase of the Bandkeramik culture (Wahl and Trautmann 2012). Other possible interpretations of the event will be discussed in the concluding section.

Asparn/Schletz (Dep. Mistelbach, Lower Austria): killed individuals left in enclosure ditches

The second Neolithic site which has been associated with aggressive intra-Bandkeramik violence is the LBK settlement of Asparn/Schletz in Austria. The settlement area, with traces of buildings and settlement pits, as well as ovens and a well (Windl 2002, 141–142), was surrounded by a multi-phase ditch system and was inhabited from the Earliest to the Youngest LBK (Teschler-Nicola 2012, 103; Windl 1999, 54). The chronologically youngest parts of the earthwork, consisting of two parallel ditches forming an oval, show several earth causeways, which are interpreted as the entrances to the settlement area (Windl 1996, 10–12; 2002, 137–140). In different parts of the fill of the youngest ditches, the scattered remains of human individuals were documented, with MNI numbers varying between "a few more than 100" (Teschler-Nicola *et al.* 2006, 61) and "c. 200 individuals" (Windl 2002, 140; both translations A. Zeeb-Lanz).

Up to now a detailed anthropological examination has been published only for 67 individuals[3]. Human remains were mainly found in the five entrance areas of the ditches, leading to the interpretation that this was a hostile attack on the Bandkeramik village, tactically concentrated on the entrances (Windl 1999, 56). The dead obviously represent the inhabitants of the settlement who tried to defend their homes, but were killed and then unceremoniously dumped into the ditches or were even massacred directly in the ditches (Windl 1999, 55–56). That these are no regular burials is clear from the incompleteness of the skeletons (Windl 1990, 19) and the numerous traumata (Teschler-Nicola *et al*. 1996; 1999; 2006). M. Teschler-Nicola found breakage patterns caused by stone adzes, combined with burst fractures and ruptures of the sutures caused by blunt force, fractures of the skull cap, and subcranial ring breakage on all 33 individuals with available skull remains, testifying to the aggressiveness of the encounter (Teschler-Nicola *et al.* 2006, 64–69). Children as well as adults of both sexes were affected. In contrast, breaks on the postcranial skeleton could be observed in only very few cases. The researchers working on the remains assume that the whole population of the village fell victim to the attack. Nevertheless, it is astonishing that no comminuted fractures of the forearm bones, so-called parry fractures, were found, which one would expect had the victims defended themselves against the deadly blows to the head. It therefore has been assumed that they were mostly lying defenceless on the ground when they succumbed to the massive assault. Whether the missing evidence for resistance accounts for the event not being a "violent crime" but rather a ritual "sacrifice" will be discussed below (see also Zeeb-Lanz 2009, 93).

Most of the individuals are not complete (mainly extremities such as hand and foot bones are missing in many cases, see Teschler-Nicola *et al.* 2006, 62) and preserved body parts were often not in anatomical connection, attesting to damage caused by carnivores such as dogs or wolves. Many long bones show corresponding puncture marks near the epiphyses. In addition, the irregular "saw-teeth" edges of mutilated bones attest to animal damage (Teschler-Nicola *et al.* 2006, 71). These traces led to the conclusion that the dead lay freely accessible in the ditch surrounding the settlement for some weeks or months before being covered by sediment eroding from the sides of the ditch (Teschler-Nicola *et al*. 1996, 57). Yet so far there have not been any analyses of the taphonomic processes active at Asparn at all. These are of particular interest, since the human remains were found in different parts of the ditch fills (Windl 1990; 1999). The interpretation of events rests solely on the human bones and thus remains incomplete.

Indeed, carnivore damage cannot explain either the isolated skulls (Teschler-Nicola *et al*. 2006, 62), which were perhaps intentionally separated from the bodies, nor the at least three skull caps also found in a part of the youngest ditch section (Windl 1990, 19). A detailed analysis of the features, the other finds categories, and the remainder of the human bone is still pending and may considerably alter the interpretation of a violent raid with deadly outcome, the isolated skulls and skull caps definitely indicating other possibilities.

Schöneck-Kilianstädten (Main-Kinzig-Kreis, Hesse, Germany): mass grave

In 2006 a rescue excavation on the route of a future bypass for the village of Schöneck-Kilianstädten unearthed a long and narrow pit or ditch section 7.50 m long and only 0.30–1.00 m wide (Schwitalla and Schmitt 2006). At the bottom of this pit, the commingled skeletal remains of at least 26 human individuals were documented (Meyer *et al*. 2015, 3). They lay closely spaced in the small area of the narrow base. Only some of the skeletons were still in anatomical connection (Meyer *et al*. 2013, 118), but due to the relatively basic level of archaeological recording during excavation this could no longer be investigated in any detail (Meyer *et al*. 2015, 3). Due to the bad bone preservation, especially the determination of the sex of the individuals proved to be difficult. Of the 13 subadult individuals, 12 could be allocated to the infans age class (younger than 13 years). Quite a number of the dead show numerous perimortal fractures generated by violent impact, affecting predominantly the tibia. Skull traumata, perhaps caused by adzes or other weapons, are also present. The few artefacts from the fill (pottery sherds, one adze, one grinding stone, and various animal bones) cannot be classed as intentional grave goods, but the sherds helped to date the feature to the Younger LBK (Meyer *et al*. 2013, 118). As there are no signs of animal damage, we have to assume that the dead, who may have fallen victim to a violent conflict, were quickly covered with earth. While extremely violent warfare between LBK communities, including mutilation of the victims, is the interpretation of C. Meyer and colleagues (2015), other reasons, e.g. a sacrificial killing, cannot be excluded[4].

Wiederstedt (Kreis Mansfeld-Südharz, Saxony Anhalt, Germany): mass grave in a settlement pit

In January 1998 a pit containing human skeletal remains was disturbed in the course of construction work in Wiederstedt (Meyer *et al.* 2004). A week-long rescue excavation yielded a 1.87 m deep round pit with vertical walls, an even base and a diameter of 1.50 m. Only the lower 0.25 m of the fill was of prehistoric origin, the upper parts being affected by soil formation processes. In the shallow prehistoric fill, ten human individuals were found. Their position varied from prone to lying on their sides or their back. As the fill beneath the skeletons contained typical settlement refuse, such as pot sherds and animal bones (Meyer *et al*. 2004, 41 note 5), the feature was not specifically dug as a burial pit but was used secondarily for the disposal of the human individuals. The backfill at the bottom of the pit revealed a number of decorated sherds dating to the Middle or Younger LBK, whereas the potentially youngest sherds, i.e. with bands filled with stitches, come from the layer above the skeletons and do not date the latter definitely (Meyer *et al.* 2004, 42). The pit probably belongs to a larger LBK settlement located during field survey around 200–500 m away.

In contrast to the sites of Talheim and Schletz, no injuries hinting at a violent conflict could be documented for the skeletons from Wiederstedt. But the absence of these traces does not exclude the possibility of homicide, perhaps in a sacrificial context, as there are many ways of killing someone which do not leave any traces on the skeleton (e.g. strangulation, poisoning, stabbing of vital organs, etc.). The age composition of the Wiederstedt population is conspicuous—eight children/adolescents and only two adults (a 35–45 year-old female and an 18–25 year-old male). Especially the age bracket infans II is strongly represented with five individuals (Meyer *et al.* 2004, 44, tab. 1). As the skeletons were tightly squeezed together, they probably ended up in the pit at the same time, making their simultaneous death rather probable. Whether a "single unfortunate event" (Meyer *et al.* 2004, 54) can be held responsible for the fatal casualties remains unproven and rather far-fetched. A definite explanation of the find situation in Wiederstedt, and the events leading to the mass grave and its contents, is difficult to state, but in any case the site definitely adds to the number of unusual treatments of the dead in the latest phase of the Bandkeramik.

Summary

The sites presented above are united by the fact that whole groups of individuals are concerned in all cases[5]. Mass burials are unusual for the Bandkeramik culture and it is debatable whether we can speak of burials in the common sense at all. The features also share the unceremonious treatment of deceased humans, which contradicts all observed burial rites of the Early Neolithic. At Talheim, Asparn, and Kilianstädten the dead moreover show a variety of lesions, in a number of cases with deadly effect. Interpersonal violence seems to be another commonality of these sites; whether the dead from Wiederstedt were the victims of a conflict situation cannot be decided. The unusual treatment of dead human individuals tells us something about the relations between the deceased and the survivors, a topic we will return to in the concluding section.

Ritual manipulation of human bodies

Herxheim near Landau (Rhineland-Palatinate, Germany): ritual concentrations of human skeletal elements in enclosure ditches

The unparalleled site of Herxheim has seen considerable attention in archaeological research, as well as in the media[6] (Zeeb-Lanz 2010). A double earthwork of trapezoid form, consisting of long ditch segments which were created by digging single elongated pits (Haack 2014), contained the dislocated and mostly heavily fragmented skeletal elements of more than 500 human individuals. The LBK settlement enclosed by the ditches had been inhabited from the Early Bandkeramik (Flomborn phase) up to the Youngest LBK, thus between c. 5300 and 4950 BC (Zeeb-Lanz *et al*. 2009b, 115). Only a part of the earthwork has been archaeologically examined, but the total number of dead for the whole ditch system can be estimated as exceeding 1000 individuals (Boulestin *et al.* 2009, 971).

This exceptional site is being analysed in an international research project supported by the German Research Foundation (DFG) since 2004 (Zeeb-Lanz *et al.* 2013, 9)[7]. During this study, it became obvious that the human remains had been deposited in concentrations of varying extents in the deeper areas of the ditch segments (Fig. 10.3). Huge amounts of pottery, stone and bone artefacts, ornaments, and animal bones were found interspersed with the human remains (Haack 2009; Zeeb-Lanz *et al.* 2007; 2009a). The pottery in the find concentrations dates the events which led to the deposition of the human skeletal fragments and body parts into a narrow time window of about 50 years at the end of the Bandkeramik (Youngest LBK, c. 5000–4950 BC). This chronological classification is being supported by a series of ^{14}C dates, although this method does not allow the definite constriction of the time span to 50 years (Zeeb-Lanz *et al.* 2013, 15).

The extraordinarily detailed examination of the human remains has yielded evidence for the systematic dismemberment and excarnation of the dead in a standardized procedure shortly after their most likely violent death. The analogies to the treatment of animals for nutritional reasons are rather obvious here (Boulestin *et al.* 2009, 976). Cut marks on all parts of the postcranial skeleton and on the skull caps are visible testimonials of the detachment of limbs and the removal of the scalp. The fragmented skeletons were then freed of any flesh and soft tissue, as attested by scrape marks on the long bones (Boulestin *et al.* 2009, 974). Numerous modification traces, all executed on "green" bone, document the systematic treatment of the dead of Herxheim. After the removal of all soft parts, the bones were meticulously smashed; especially the large long bones of the extremities were broken into pieces which often do not exceed sizes of a centimetre or so (Zeeb-Lanz *et al.* 2013, 35).

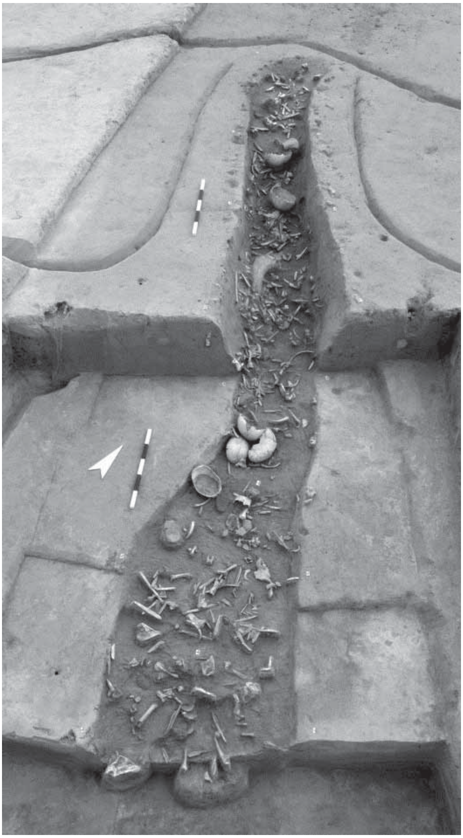

Fig. 10.3 A typical concentration (K 9) of human bone fragments, pottery sherds, and other material at Herxheim near Landau (Rhineland-Palatinate, Germany). Note the clusters of skull calottes in the centre. Photo: F. Haack, GDKE Rheinland-Pfalz.

Most likely, the individuals were victims of intentional killing before they were dismembered and defleshed. Although no definite deadly traumata could be recognized on either skulls or long bones, it has to be kept in mind that many ways of killing do not leave any traces on the skeleton (Boulestin *et al*. 2009, 977; Zeeb-Lanz *et al*. 2013, 35). The age structure of the population also suggests an unnatural cause of death. The mortality rate at Herxheim is completely different from that of death populations known from Bandkeramik cemeteries (Zeeb-Lanz *et al*. 2013, 37–38). Young adults are present at a much higher percentage than is usual for a cemetery population consisting of naturally deceased persons (Biermann 2000; Zimmermann *et al*. 2009).

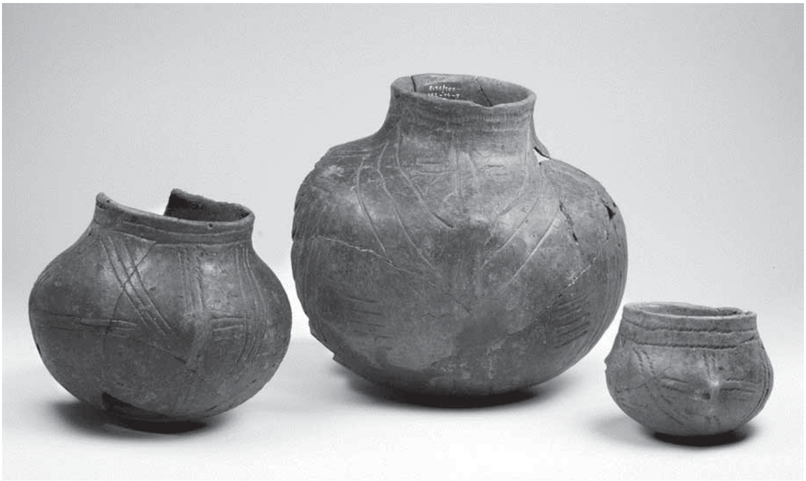

Fig. 10.4 Restored vessels of the Palatinate style from Herxheim near Landau (Rhineland-Palatinate, Germany). Photo: F. Haack, GDKE Rheinland-Pfalz.

The ornamented pottery found with the human bones is of extraordinary quality in make, form, and decoration. Many pots could be restored to large parts of the original vessels or whole pots, proving that the smashing of the pottery had taken place directly on site (Fig. 10.4). Valuable adzes and flint blades made from high-quality imported raw material were also destroyed (Zeeb-Lanz *et al*. 2006, 68–70). In addition, fragments of what had been useable grinding stones were found in great quantities. The grinding stones, as well as big sandstone slabs, had been burnt before they were violently smashed into bigger or smaller fragments. Thus, the destruction of valuable objects constitutes the main theme of action across the complete finds spectrum; the human bodies were also treated as objects and not as persons, as like the other artefacts they were broken into fragments and then deposited as "ritual refuse". Herxheim must have been the location of a special ritual which concentrated on the destruction and discard of precious objects.

Following the analysis and interpretation by Bruno Boulestin, there are also strong arguments for the consumption of human flesh and the exploitation of skeletal elements for fat and marrow extraction through cooking (Boulestin *et al*. 2009, 977). The main arguments for cannibalism as part of the extraordinary ritual ceremonies carried out in Herxheim are the treatment of the human individuals like animals butchered for nutritional reasons, the absence of specific bones rich in fat and marrow, and the seemingly systematic chewing of finger and foot bones. Statistically, the bone preservation, the cut and scrape marks, as well as further manipulations of the bodies, are comparable with other sites for which cannibalism is regarded as proven (Boulestin 1999; White 1992). However, factual proof for anthropophagy in prehistoric find complexes cannot be provided, and the comparative sites cited by Boulestin have ultimately also not delivered unmistakable proof of cannibalism. Thus the question of ritual cannibalism at Herxheim remains unanswered, even though a number of arguments support the hypothesis that it was one aspect of the ritual actions.

Not consistent with the pattern of exploitation of the dead for nutritional reasons is the special treatment of the human skulls at Herxheim. The facial bones and skull base were cut off from nearly 500 skulls, leaving only the skull cap in the form of a shallow bowl. The standardized dressing of the skulls suggests a special significance of the head in the frame of the ritual actions (Zeeb-Lanz 2011; Zeeb-Lanz *et al*. 2013, 34–35). Differing from most of the well-known skull cults (Wieczorek and Rosendahl 2011), the Herxheim skull calottes were not kept after their probable utilization in the ritual, but shared the fate of the other skeletal remains and were disposed of as ritual waste in the ditches. Even when being discarded, the calottes received a special treatment: several skull nests could be documented (e.g. Zeeb-Lanz 2011, 49 fig. 5), which can only occur due to an intentional deposition by people (Fig. 10.3). These nest-like concentrations could in some cases also be observed for whole skulls that had not been manipulated, a fact that underlines the special symbolic value of the heads of the sacrificed victims in Herxheim. With regard to the cannibalism hypothesis, the high-grade fragmentation especially of the long bones is also worth mentioning. If retrieval of marrow was the main aim, it would be entirely sufficient to cut off the epiphyses and split the bone shaft lengthwise (Orschiedt 1998, 41; compare also the Iron Age site of Roseldorf[8]). The intensive fragmentation of the bones rather seems to be a matter of changing the character of the human skeleton (or even the human individual) beyond recognition (for this aspect, also in cremations, see Hofmann and Orschiedt 2015; Pechtl and Hofmann 2013, 133).

In view of its size, the area surrounded by the double ditch system cannot have contained more than ten houses and thus a maximum of 100 inhabitants per phase. This begs the question of the identity and origin of the more than 500 sacrificed and ritually smashed human individuals. Strontium isotope analyses of the molars of nearly 100 individuals show that 90% of the dead from the ditch system at Herxheim were non-local, but were born and grew up in mountains with a granite or gneiss substrate (Turck in press; Turck *et al*. 2012). When examining the material culture, researchers had originally assumed that the dead were of Bandkeramik origin, perhaps enemies of the settlers from Herxheim. This assumption has been challenged by the strontium isotope measurements, as up to now there is no evidence for Bandkeramik settlements in low mountain ranges with granite or gneiss substrate. In contrast, first aDNA analyses show that of nearly 30 individuals sampled, all possess mitochondrial DNA haplogroups that are common in LBK populations (Bramanti *et al*. 2009; Haak *et al*. 2005; 2010). The current state of research thus reveals a strong discrepancy between the results of strontium isotope and aDNA analyses. The former refer to a mountain population which one is tempted to equate with the latest Mesolithic groups[9]. Yet on the one hand the mountains with granite subsoil in the wider surroundings of Herxheim have yielded hardly any traces of Late Mesolithic hunter-gatherer populations, while on the other hand it is totally improbable that the latter should have lived an isolated life in a mountainous refuge while the surrounding plains were inhabited by LBK farmers (see also Löhr and Zeeb-Lanz 2013, 65–68). The DNA analysis opens the possibility that the manipulated dead from Herxheim could be connected with a Bandkeramik population whose way of life has to be seen in a hunter-gatherer tradition and who lived in mountainous regions (Turck *et al*. 2012, 160). However, archaeological evidence of any kind is so far absent for this interpretation, too. The site of Herxheim with its unique ritual lacking any tradition in the earliest farming culture of central Europe remains enigmatic.

Tiefenellern, Jungfernhöhle (Bavaria, Germany): ritually (?) manipulated skeletons in a cave

The Jungfernhöhle (“Damsels’ Cave”) near Tiefenellern was discovered in the 1950s (Fig. 10.5). After illegal digging activities, the cave was completely excavated under archaeological supervision in only a few weeks (Kunkel 1955, 30). A stratigraphic excavation and detailed recording were naturally not possible under these circumstances. The most important finds were the skeletal remains of more than three dozen human individuals, partly fragmented and mixed with pottery from various prehistoric periods, as well as animal bones and some bone and stone tools. The pottery is dominated by an especially well-produced and extensively decorated ware, which can be dated to the youngest phase of the Bandkeramik culture and comprised the remains of around 110 decorated pots. Smaller numbers of sherds from younger Neolithic cultures and from the Bronze and Iron Ages were also found (Kunkel 1955, 79–87), making the date of the human bone uncertain. However, ^{14}C dates from 11 individuals date eight of these into the time of the Bandkeramik (Orschiedt 1997; 1999, 165).

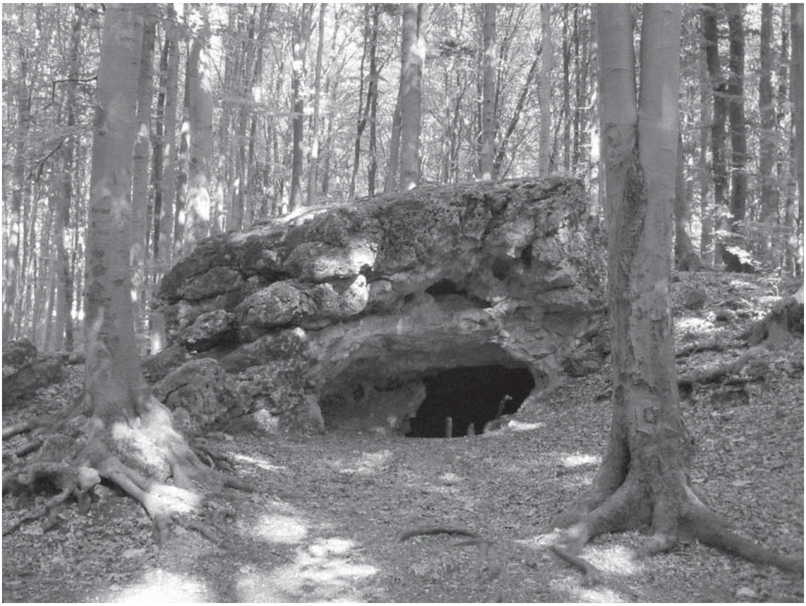

Fig. 10.5 Entrance of the “Jungfernhöhle” cave near Tiefenellern (Bavaria, Germany). Photo: F. Haack.

G. Asmus, who examined the anthropological material for the first publication, concluded that the human remains from the Jungfernhöhle represented the remnants of cannibalistic meals (Asmus 1955, 67). The archaeologist in charge spoke of "human sacrifices with a cannibalistic streak" (Kunkel 1955, 130; translation A. Zeeb-Lanz). These interpretations stayed undisputed until the later 1990s, when H. Peter-Röcher expressed fundamental doubts concerning the theory of cannibalism in the Jungfernhöhle (Peter-Röcher 1994, 103; 1997); she proposed the hypothesis of secondary burials instead. The most important argument for her line of interpretation was the absence of most small skeletal elements, such as hand and foot bones, as well as vertebrae and teeth (Peter-Röcher 1994, 99–104). This was supported by J. Orschiedt after renewed study of the bones (Orschiedt 1997; 1999, 164–178). The crucial argument against cannibalism was the absence of cut marks. However, the hypothesis of secondary burial is also being questioned. In 2012 a fresh anthropological examination of the bones was carried out, casting considerable doubt on Orschiedt's explanations (Boulestin in prep.). Moreover, between 2008 and 2013 examinations of the spoil heap from Kunkel's excavations yielded many small bones from human hands and feet, as well as other small human bones and a considerable number of human teeth (Seregély 2012, 67–72); until now more than 10,000 bones have been recovered. This invalidates one of the main arguments in favour of a secondary burial scenario. Asmus, Peter-Röcher, and Orschiedt had all assumed that the spoil of the old excavation had been sieved, which was obviously not the case (Seregély 2012, 70). The findings from the new excavations led to the assumption that the human skeletons had in all probability been brought into the cave intact. Assuming that the majority of the individuals date to the Bandkeramik, we here have another site where human individuals were not buried following the traditions of the LBK. An interpretation in terms of human sacrifices should be considered (Zeeb-Lanz 2014).

The fragmentation of the long bones is selective (Boulestin in prep.), indicating an intentional destruction of the individuals. Although a concluding assessment of the Jungfernhöhle is still lacking, it is already clear that the "definite proof of secondary burials" (Orschiedt 2004, 99; translation A. Zeeb-Lanz), can no longer stand. The site represents a further place where in the Final Bandkeramik, human individuals were manipulated and treated in a way totally unusual for the early farmers of central Europe.

The pottery from the Jungfernhöhle also merits attention. More than 100 Bandkeramik pots could be partly reconstructed, hinting at intentional destruction, perhaps as part of a ritual. On the other hand, the pots could also have been offered whole as sacrificial gifts and could have been destroyed by post-depositional processes. The decorated pots are finely made, well-shaped vessels with unusual ornamentation. They can be compared with the showpieces of the Herxheim pottery. In both places, specific bone artefacts, quite likely tools for modelling and decorating the pots, were retrieved, suggesting the production of pottery especially for the ritual events (Haack 2012, 28). In Herxheim, the pottery presumably played an important role in the rituals; by comparison one could suggest that the pots from the Jungfernhöhle also acted as components of a ritual and could be interpreted as sacrificial offerings, a role which has already been discussed for various concentrations of valuable ceramics of the LBK period (e.g. Elburg 2010; Hendel 2012, 33–34; Seregély and Link 2009).

Zauschwitz (Saxony, Germany): ritually (?) manipulated skeletal elements in a settlement pit

The pit with human bones from Zauschwitz was found in 1957. The round feature contained the remains of at least seven human individuals (three children and four adults; Pasda *et al*. 2004, 124) alongside a few cattle bones and a number of undecorated Bandkeramik sherds and flint fragments (Coblenz 1962). The human remains consisted of a nearly intact skull, numerous skull fragments, and a large amount of long bones. The latter were missing the epiphyses; their shafts had been broken transversely and then split open. W. Coblenz (1962) emphasizes that neither the skull fragments nor the long bones could be restored to whole pieces, meaning that not all body fragments had been deposited in the pit. There are scorch marks on the skull fragments, mostly on the occipitals and only on the outer side of the fragments. In contrast, the long bones were not affected by fire. Smaller bones had obviously not been smashed; it is noticeable that facial bones are mostly missing. Coblenz interpreted this as the remains of a cannibalistic “sacrificial feast” (Coblenz 1962, 69; translation A. Zeeb-Lanz), comparing the contents of the pit from Zauschwitz to the human remains from the Jungfernhöhle (discussed above).

A re-assessment of the bones by H. Grimm revealed manipulations such as stab canals and cut marks, for example on a mandible (Grimm 1991, 11). On this basis, Grimm also regarded cannibalism as a possible reason for the condition of the bones from Zauschwitz (Grimm 1991, 15). In 1999, the bones were analysed a third time (Orschiedt 1999). Orschiedt also drew the connection to Tiefenellern, but—in analogy to his interpretation of the Jungfernhöhle—saw Zauschwitz as the scene of a secondary burial ceremony (Orschiedt 1999, 73–74). However, in contrast to K. Pasda and colleagues (2004), Orschiedt did not have access to most of the long bones, which were only recently rediscovered and have the potential to change his interpretation.

The pottery from the pit with human bones belongs to the Younger LBK (Coblenz 1962, 68). As such, the finds from Zauschwitz provide further evidence for an unusual treatment of deceased persons connected with body manipulations in the Late Bandkeramik.

Menneville “Derrière le Village” (Aisne Valley, France): manipulated skeletons in a settlement ditch

The eastern quarter of the 6.5 ha Bandkeramik village of Menneville “Derrière le Village” was examined from 1977–1978 (Coudart and Demoule 1982) and from 1988–1992 (Farruggia *et al*. 1996, 119–120). The settlement is surrounded by an earthwork consisting of long pits or ditch segments, confirmed in the western part by aerial photography and geophysical prospection (Farruggia *et al*. 1996, 120, fig. 1; Hachem *et al*. 1998, 129). Earth bridges between the segments are generally 3–5 m wide; in the south there is a 60 m wide gap. The excavation revealed postholes and loam pits of eight Bandkeramik longhouses in this western part of the settlement in varying states of preservation (Hachem *et al*. 1998, 131–132). In addition, in the eastern part of the settlement as well as directly outside the ditch perimeter in the south, the remains of at least 30 human individuals of both sexes and various ages were excavated[10]. The grave group outside the ditch system consists of seven single inhumations in crouched position, which is typical for Bandkeramik burials (Hachem *et al*. 1998, 132). The six settlement burials, all found in the direct vicinity of longhouses, were those of children. Further regular crouched burials were found in the settlement area and the northern part of the ditch.

Most interesting for our present discussion are the remains of 11 children, which were found in “chaotic” (Hachem *et al*. 1998, 133) disorder in various ditch segments of the northern part of the enclosure. Their find situation is totally different from that of the other children found in the settlement area and their great number is unusual for the Bandkeramik culture (Farruggia *et al*. 1996, 147). Three features contained multiple burials. The double burial in ditch segment 273, which is the best preserved, lay on the bottom of the ditch at its southern end. The c. 6–8 year-old children were positioned facing each other, but with their heads near the knees of their counterpart (Hachem *et al*. 1998, 133, fig. 5). Both skeletons were incomplete and their posture did not correspond to the usual pattern of Bandkeramik burials. Numerous animal bones, amongst others several cattle bones and a cattle horn core, but also goat and sheep bones, were found scattered around the human bones. The cattle bones bore signs of butchery, such as cut marks, smashed diaphyses, and split bones for extracting the marrow. The bones of sheep/goat were less frequent, but always belonged to bigger body parts (Farruggia *et al*. 1996, 160). Only a small number of sherds belonging to large vessels could be documented. The second double burial in the northern ditch consisted of two fragmentary child skeletons, whose skulls and a number of long bones were documented in a totally irregular position (Farruggia *et al*. 1996, 150–151; Hachem *et al*. 1998, 134–135). In this grave there were also greater quantities of cattle, goat, and sheep bones.

The seven individuals in ditch segment 188 form three loose groups, but were deposited at the same time, as they were all lying in the same layer. Only one of the child skeletons was nearly complete, of the others only varying numbers of bones not in anatomically correct positions were found. There are again bones of cattle and sheep/goat. Rather striking is the deposition of two bucrania, which lay only a little above the layer with the human bones and are supposed to be in direct connection with the deposition activities (Hachem *et al*. 1998, 136). Given their stratigraphic position, the excavators argue for a simultaneous deposition of the three groups of children. This is also supported by the placement of all three groups in the northern section of the ditch and in adjacent segments of the earthwork; moreover, all the children lay in a layer of fine grey sediment with charcoal speckles, which was identical in all three segments (Hachem *et al*. 1998, 136). The bucrania, cattle, goat, and sheep bones are interpreted as components of the burial ritual: while the cattle bones might represent the remains of a funeral feast, the sheep and goat bones belonging to bigger body parts could be interpreted as gifts for the deceased (Farruggia *et al*. 1996, 165). The reasons for the extraordinary treatment of the Menneville children remain unclear. Social and religious motives are considered (Jeunesse 1996, 267), as well as massacres or human sacrifices (Farruggia *et al*. 1996, 153; Spatz 1998, 16).

Once again, human individuals were treated in a way which is not normally found in the spectrum of activities of the earliest farming communities in Europe. Whether the manipulated child skeletons in the ditch segments are to be regarded as burials or perhaps as sacrificed victims cannot be decided.

Summary

The four sites presented in this section all yielded human bodies treated "abnormally" after their death. For Herxheim, the ritual character of the body manipulations is attested by the standardized and repetitive way of dismembering, defleshing, and destroying the human individuals, the normative treatment containing a certain range of variation. The material culture was treated in a similar way, and the smashing of pots and destruction of stone tools and grinding stones underlines the ritual character of the whole scenario. At the Jungfernhöhle, human individuals were also treated in a special way, including selected breakage of long bones. Pottery likewise played a role in these events. In analogy to Herxheim, a ritual scenario may be supposed. In Menneville, the disarticulated bodies of the children in the ditch segments are associated with horn cores of cattle or *capridae*, in one case even with bucrania. With all due caution, a ritual background for the depositions of human skeletons in Menneville can hence also be proposed. For Zauschwitz, a ritual motivation for the manipulations of human bodies can only be suggested in analogy to the other sites with manipulated individuals, but remains without further proof.

Discussion

The cases of extraordinary finds presented above all date to the Younger and Youngest LBK, and hence the culture's final stages. It is not unusual for phases of change, such as the end of one culture sequence and the beginning of a new one, that cultural and social transformations result in breaks in the traditional behaviour and rites of a society, which can occasionally be connected with violence (e.g. the French Revolution: Campbell 2006; Thamer 2013). Violence has always been closely associated with religion, and "the sacred" often turns out to be "sacralised violence" (Burkert 1983, 15). Ritual sacrifices, including humans, were an important means for prehistoric communities to preserve and strengthen the social cohesion of the group, as well as collective identity. Through ritualization, this violence is curtailed and controlled. It could become a considerable threat for a community if it were not incorporated into the socio-cultural classification system in the form of an identity-establishing communal sacrifice (Vollmer 2009, 54–55, 116–117). Ritualized violence thus transpires as a means of identity creation that promotes communal commitment, which is especially important in times of crisis—as postulated for the end of the Bandkeramik (Jeunesse 2011; Spatz 1998, 14–15; Teschler-Nicola *et al*. 2006, 74; Zeeb-Lanz 2009, 96–97).

The cases of unusual manipulations of human bodies presented in this paper, some connected with interpersonal violence, can admittedly not necessarily be separated into groupings, as was done here. Also, the conclusions we have drawn concerning potential ritual scenarios are not really testable in the cases of Zauschwitz, Kilianstädten, or Wiederstedt. But even the seemingly so evident findings from Talheim und Schletz, when examined in detail, allow other conclusions than the dominant interpretations of violence scenarios between hostile Bandkeramik groups, until now considered proven beyond doubt (Zeeb-Lanz 2009, 92–93).

For Talheim, an alternative hypothesis was already proposed in the 1990s. Karl Narr contemplated whether instead of an assault on the Talheim village community, the local settlers might not themselves have sacrificed a group of prisoners (Narr 1993). As not all the individuals in the mass grave actually show lethal injuries (Narr 1993, 298–299; compare Wahl and König 1987), it has to be asked whether deposition in the mass grave only occurred when all victims had succumbed, or whether some were killed using methods that do not leave any traces on the skeleton. Furthermore, it is suspicious that the dead did not resist being slain or at least heavily injured. As already suggested by Narr (1993, 303) an execution, potentially in the form of ritual human sacrifice, might fit these observations better than a flight situation, which should have triggered defence or resistance from the pursued[11]. In the light of the other exceptional sites discussed here, Narr's remarks lead to the question whether the simple explanation of "violent crime" has to give way to more complex considerations of possible sacrifices or multi-level ritual actions.

The situation at Schletz is also less obvious than the relevant publications (Teschler-Nicola *et al*. 1996; 1999; 2006; Windl 1996; 1999) claim. The site has been only partly excavated and the human remains are incompletely studied. Against this background, it is debatable whether the suggested abduction of the young women (Teschler-Nicola *et al*. 1996, 62; 2006, 61) can be maintained—these "missing" individuals could be anywhere in the unexamined 80 % of the site (see Zeeb-Lanz 2009, 93). In addition, the isolated skulls and especially the three skull caps cannot be explained by animal gnawing or attacks by human aggressors. The conspicuous distribution of the deadly injuries—the traumata all occur on the head, whereas the postcranial skeleton is hardly affected at all (but see Teschler-Nicola *et al*. 2006, 69)—leaves the option that these were human sacrifices who were unceremoniously dumped into the ditches of the earthwork after the performance of the ritual. Following this interpretation, the ritual intent of the violent actions would again represent the most significant aspect.

For Herxheim, the ritual component inherent in the normative, repetitive destruction of valuable objects and human bodies has already been emphasized (e.g. Boulestin *et al.* 2009, 979; Zeeb-Lanz *et al.* 2007, 66–267; 2013, 41–42).

The composition of the skeletal assemblage at Menneville stands out due to the above-average number of children, who were deposited in unusual body positions. Moreover, the animal bones associated with the dead, seemingly following a certain pattern, are further clear evidence of the special significance these deposits held for the Menneville community. The hypothesis of ritual killing and subsequent manipulation of the corpses cannot be directly proven, but neither can it be dismissed out of hand. J.-P. Farruggia and colleagues (1996, 53) point to the chronological position of the extraordinary findings from Menneville, situated at the transition from the Bandkeramik to the Villeneuve-Saint-Germain group; problems concerning social identification and group membership are a frequent phenomenon in such times of change and could express themselves in an unusual new treatment of dead persons.

Whether ritual motives can explain the findings in Kilianstädten or Wiederstedt is unclear. Yet in all the sites presented in this paper, the dead were never treated or buried in the ways customary for the Bandkeramik—we are witnessing drastic breaks with the centuries-old traditions of the Bandkeramik *koine*.

E. Weiss-Krejci (2011) has extensively dealt with the archaeological mortuary record and the “funerary cycle”, a transitional period which starts with A. van Gennep’s well-known “rites of separation”, followed by the actual transitional period and its “rites of passage”, and finally the “rites of reintegration” (Van Gennep 1960). Weiss-Krejci defines the beginning of the archaeological mortuary record with the death of a person and its endpoint with the detection of the remains of the dead by modern archaeologists (Weiss-Krejci 2011, 69, fig. 4.1). The key point we wish to draw from her study here is that the organization and contents of the three parts of the funerary cycle result from the social interrelation between the deceased and the bereaved (Weiss-Krejci 2011, 71–72). Burial customs are defined by the social relations between the dead and the living, which are usually rather tight in a prehistoric community. This reflection of social ties also applies to human bodies which are treated in ways outside the usual funerary cycle—as in our examples. Judging from the treatment of the dead, the social relations between the killed individuals of Talheim, Schletz, Herxheim, and the other sites and their aggressors were not friendly or positive. The dead seem to have been others, perhaps even negatively classified as strangers, who could be “used” as props or even principal performers in special rituals including human sacrifice and body manipulation. Interestingly, Weiss-Krejci (2011, 76) mentions victims of sacrifice or murder as individuals who were not properly buried but treated in “extra-funerary events”. Assuming that the manipulated individuals were of LBK origin in most of our cases[12], as strongly suggested by associated material culture, there must have been groups of LBK people who were seen as “other”, implying that regionalization in the Late LBK was not only limited to material culture, but concerned the differentiation between groups of humans. This splitting up of the pan-European LBK population probably was an important factor in the assumed crisis at the end of the Bandkeramik culture.

With its extraordinarily high number of killed people, the special quality of the “ritual objects”, and the exceptional violence visible in the destruction of human skeletons, pottery, and other artefacts, Herxheim certainly occupies a key position in the discussion surrounding the crisis at the end of the LBK and the cultural and ritual activities it may have triggered (see also Spatz 1998, 18; Teschler-Nicola *et al*. 2006, 72). The possibility of more than 1000 cannibalized persons adds another dimension (Boulestin *et al*. 2009, 977).

The crisis at the end of the LBK, which led to a rather abrupt end at least in the western part of its distribution (Gronenborn 2012, 246–248; Jeunesse 2011, 187; Spatz 1998, 18)[13], has brought representatives of an environmentally determinist persuasion onto the scene, who see climate deterioration, overpopulation, and famine as catalysts for violent conflicts and the ultimate collapse of the cultural system (e.g. Golitko and Keeley 2007; Gronenborn 2012; Lontcho 1998, 49; Lüning 1982, 33)[14]. We rather favour a socio-culturally induced crisis in the sense of the loss of function of the ritual, religious, and all-encompassing cultural value system, a loss which expressed itself in unusual, extreme, and often violent rituals and actions which were not part of the socio-cultural traditions of the Bandkeramik culture (Zeeb-Lanz 2009; 2014). It is not unusual that tribal communities react with the introduction of new and often extraordinary rituals to crisis-laden conditions which manifest themselves on an ideological level rather than being due to external causes (Lanternari 1966, 12, 18). The radical renunciation of traditional funerary rites, the aggressive manipulation of human life, or the extraordinary ritual deposits described in this paper all belong to the pool of possible reactions to crisis situations; the ritual site of Herxheim with its human sacrifices, potential ritual cannibalism, and ritually motivated destruction of material culture is the perfect exemplar for the crisis at the end of the LBK culture.

Another interpretation is offered by C. Jeunesse, who sees a long-lasting development of symbolic and social mechanisms through which human communities were formed and sustained, but also dissipated again; the establishment of a new symbolic system then marks the beginning of a new culture phase (Jeunesse 2011, 187). The destruction of valuable pottery as documented in Herxheim would for him represent an important step in the dissolution of the symbolic repertoire of the culture as a whole; following his views, the actors of the destruction rituals in Herxheim would hence already have arrived in a new era.

An exact description and characterization of the crisis at the end of the Bandkeramik culture surely remains a great challenge for archaeologists. Reconstructing the cultural context of this time only on the basis of material residues will always remain work in progress, peppered with contradictions. Warfare in the LBK, triggered by climate crises and related food shortage, has recently again been seen as the dominant motivation for the violent treatment of humans in the late LBK (Meyer *et al.* 2015, 5). However, to see it as the reason behind all the unusual situations described here seems to us to oversimplify the range of incentives for the strange phenomena witnessed in the late LBK.

In any case, the various examples for extraordinary practices and rituals at the end of the Bandkeramik show that especially in this last phase of the culture we can grasp “diversity in uniformity” (Modderman 1988) to a particular degree.

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Notes

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[1] In their recent article about the assessment of burials as “normal” or “irregular”, Pechtl and Hofmann (2013) argue that changes in burial customs must not necessarily be an indicator of an impending crisis in the respective culture but in fact may reflect “creative adaptions” to changing conditions in society. We do agree with their point of view regarding the irrelevance of the terms “normal” and “irregular” concerning burials, but we regard Herxheim and a few other sites as outside the burial cycle and thus the arguments of Pechtl and Hofmann are not relevant for our case.

[2] For further examples of extraordinary treatment of dead human individuals see Zeeb-Lanz (2009; 2014).

[3] The random sample has meanwhile been enlarged to 120 individuals, but results are not yet available (compare Teschler-Nicola *et al*. 2006, 63 note 9).

[4] The detailed analysis of the Kilianstädten site was published shortly before the press date for this volume, therefore we were not able to discuss the results of Meyer *et al*. (2015) in detail here (they now consider the site “an illuminating example of characteristics of nonstate warfare” (Meyer *et al*. 2015, 5)).

[5] This factor differentiates the sites discussed here from a site like Eilsleben, where the tightly crouched skeleton of a woman covered with sandstone slabs was found in the settlement ditch; the deposition is interpreted as a human sacrifice (Kaufmann 2003).

[6] See e.g. http://channel.nationalgeographic.com/channel/explorer/episodes/lost-cannibals-of-europe/; http://channel.nationalgeographic.com/channel/explorer/videos/human-remains-of-the-day/; http://www.arte.tv/guide/de/044128-000/kannibalen-im-herzen-europas; http://www.independent.co.uk/news/world/europe/evidence-of-mass-cannibalism-

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uncovered-in-germany-1835341.html;
http://onlinelibrary.wiley.com/doi/10.1002/biuz.201410536/abstract.

[7] The first of three volumes presenting the results of this research will go to press presumably in July/August 2016.

[8] Thanks to Veronica Holzer for providing photographs of longitudinally fractured human bones from the offering pits of the Celtic sanctuary at Roseldorf (KG Roseldorf, Austria; Holzer 2009). These manipulated bones show that the bone shaft was first cut into larger pieces and then split open longitudinally. This method is the established way to extract the marrow from long bones, although it is unclear whether this was the aim in this case (see also Gehlen 2004, 237).

[9] In 1955, O. Kunkel and G. Asmus had proposed a similar argument for the skeletons in the Jungfernhöhle near Tiefenellern, which they thought represented the Mesolithic victims of a Bandkeramik population who killed and ate them during a fertility ritual (Kunkel 1955, 76–77, 131–132).

[10] The 32 individuals mentioned by Farruggia *et al*. (1996, 146) cannot be identified in the list provided; depending on how one counts the individuals one arrives at a number of 31 or 35 (compare also Veit 1996, 153–154: “35 to 36 individuals”).

[11] However, J. Wahl points out that the locations of the skull traumata and the angles of impact are rather variable, which renders a scenario of sacrifice or execution less probable, although it should still be taken into consideration (J. Wahl pers. comm. 15.10. 2014).

[12] Although the situation is not clear for Herxheim, see discussion above.

[13] The scientific community is not in total agreement about the way in which the LBK found its end—slowly or abruptly; for a different view see the paper by Luc Amkreutz in this volume.

[14] In contrast, D.P. Braun and S. Plog (1982, 502) argue that increasing population pressure leads to reduced areas available for cultivation and to harvest insecurities, so that existing social networks should be strengthened and communication between settlement groups would intensify.

REGIONAL NETWORKS

CHAPTER ELEVEN

FROM DISTRIBUTION MAPS TO "ETHNIC" DIVERSITY WITHIN THE SOUTHERN BAVARIAN LBK

JOACHIM PECHTL

Introduction

The theory of ethnic interpretation in prehistory

Identifying ethnic groups by archaeological means has a long tradition, and in fact has been one of the crucial questions almost from the beginnings of academic archaeology in central Europe (Eggers 1986, 199). Especially the attempt of tracing the fate of people known from historic records backwards in time commanded much attention. Although Gustaf Kossinna was not the first to try this, his name is inseparably connected with this research objective. He sought to define a scholarly method which could serve as an appropriate tool and which is largely based on mapping the archaeological record (Eggers 1986, 199–254). Famously, he claimed that "clearly circumscribed provinces of archaeological cultures in every case coincide with certain peoples or tribes" (Kossinna 1936, 15; translation by author). Most important is Kossinna's belief, broadly accepted by that time, that culture is an intrinsic quality of people, somehow almost biological (Eggers 1986, 238–239). Among other deficiencies, it was mainly the firm connection between one people and its one culture which inevitably led to considerable problems (Eggers 1986, 199–254)[1]. Nevertheless, this idea found followers throughout Europe and beyond and a lot of use and maybe even more abuse was made of it, especially in times of nationalism and fascism.

In recent decades, archaeological research has focused on "identity" in a broader sense and "ethnicity" as one aspect of identity gained renewed attention (Jones 2003, 1–18; Sommer 2007, 61–71). At the same time, the concept of "tribes" and "peoples" was widely discussed in anthropology.

While some scholars took extreme positions and completely denied the relevance of such categories, the majority accepted the importance of "ethnic groups", but bearing in mind the political sensitivity of categories like these (Brumann 2007, 31; Davidovic 2006, 52; Jones 2003, 1–18). In recent years, one can even note a more relaxed attitude towards the term "tribe" where it seems adequate (Suzuki 2004).

Current discussions generally stress several key characteristics of ethnic groups. They usually are defined as groups of individuals who regard themselves and are regarded by others as sharing ethnic identity—which often is connected with a certain culture—and who believe in a common descent (Brumann 2007, 31; Jones 2003, 84; Sommer 2007, 68). Therefore, an ethnic group is much more an imagined entity of individuals who have acquired membership than a separate biological population (Brumann 2007, 32). However, such imagined qualities can become highly relevant to the individuals concerned. Ethnic groups develop in contrast to other comparable groups (Brumann 2007, 31; Lucy 2005, 95–96). Internally their supposed homogeneity is generated by emphasizing few common characteristics while neglecting many similarities with other groups (Davidovic 2006, 51). In addition, total homogeneity in cultural respects is not given (Brumann 2007, 34–37). Demarcating boundaries is often influenced by the actual political situation and by personal interests (Davidovic 2006, 51; Sommer 2007, 68). To mark boundaries, use is often made of symbolic behaviour, including rituals, of material culture, and of different socio-cultural practices, the "habitus" (Brumann 2007, 31; Davidovic 2006, 55; Jones 2003, 128–129; Lucy 2005, 95–96). Thus, an ethnic identity is neither a primordial quality nor is it unalterable, but it is a dynamic way of structuring social relations (Brumann 2007, 31; Lucy 2005, 96–100). Its existence cannot be taken for granted for all human societies, but where it exists it can become very powerful (Davidovic 2006, 51; Sommer 2007, 72). Furthermore, individuals can sometimes resort to different parallel or hierarchical ethnic identities. The actual choice depends on the current counterpart (Brumann 2007, 31). Thus the concept of ethnicity is a simplified model whose existence needs to be tested in every single case (Sommer 2007, 72), but where positively identified it allows deep insight into prehistoric societies.

This leads to serious problems when dealing with prehistoric examples. Firstly, it is not clear to what extent entire cultures and ethnic groups really do correlate (Brumann 2007, 34). Secondly, only material culture is directly preserved, and it is possibly affected by many different factors (preservational, functional, social, and so on). Thirdly, we have no direct indicators of prehistoric emic self-conceptions; and fourthly, it is not obvious which features were actually used for defining ethnic groups (Sommer 2007, 71).

Yet some other considerations are quite encouraging. First of all, “culture” has a systemic character, and thus very different elements tend to be connected. Hence, material culture can have the potential to allow conclusions concerning a past culture as a whole and thus indirectly gives access to the question of ethnicity (Brumann 2007, 37). To improve the evidence it is necessary to study many features from different areas of life, at best statistically (Brumann 2007, 49–51; Sommer 2007, 71). These single features then need to be contextualized to determine their position in the past culture and to check their specific mode of distribution. Depending on the source material, this might provide hints regarding everyday socio-cultural practices, as well as symbolic and ritual action. Use of objects, dress, architecture, burial rites, preparation and consumption of food, and many other aspects can unconsciously as well as actively bind together social groups and separate them from others (Lucy 2005, 105–106). When actively used, such differences most probably have symbolic connotations and even allow conclusions on emic perceptions. Identification of such culturally different groups is mainly possible if they settle in reasonably circumscribed areas. Thus the most important tools are spatial analyses, either by mapping or by statistics, but in either case the sources need to be checked critically. If analyses of the distribution of different features reveal that different kinds of material occur together, that the distributional boundaries of these materials coincide, and that these boundaries are emphasized actively, this most probably can be interpreted as a result of cultural differences due to ethnic structures. As Brumann (2007, 39) points out, this can never be more than well-founded speculation, but this is already a success in interpreting the past.

The LBK in focus

The LBK is a virtually perfect test case for identifying ancient social structures at different levels. Density and preservation of settlements is above average, a huge body of diverse small finds is present, very richly decorated ceramics enable detailed typological analyses, and differentiated burial customs are documented. In fact, different levels of social organization have been worked out, such as household groups, settlements, micro-regions, regions, and the entire culture (Hofmann 2010, 34–35). However, intensive research has so far mainly focused on small-scale units, especially on household groups, settlements, and micro-regions. These are sometimes cross-cut by kin structures, which seem to be present in the form of lineages or clans (Strien 2005; 2010, 76–78). Above that, the LBK is mostly considered as one huge entity. Since the times of V.G. Childe (1925, 173) at the latest, this culture has constantly been equated with one ethnic entity, even if often implicitly (Sommer 2007, 65–67). Regional diversity within the LBK has long since been observed (Modderman 1988), and sometimes detailed typological analyses were carried out (e.g. Jeunesse 1994, 5–14; Rulf 1997). But usually not much interpretative use was made of this, particularly concerning ethnicity. Only in rare cases were conspicuous boundaries observed in chert distribution and ceramic style explicitly interpreted as indicators for ethnic groups, most importantly in Westphalia and in the Rhine–Main area (Kerig 2010; Zimmermann 2007). This article presents the results of intensive work in southern Bavaria which provides new evidence for cultural boundaries within the LBK. In this case, they are not only based on chert distribution and ceramic style. This broader basis will hopefully allow a more stringent argument to be built, thus leading to a higher explanatory power for an ethnic interpretation.

Spatial structures within the southern Bavarian LBK

The foci of this study are the LBK settlement zones in southern Bavaria, foremost the Gäuboden and the Tertiärhügelland (Fig. 11.1). The Gäuboden is a loess-covered alluvial plain that extends roughly from Regensburg to Pleinting in the Danube valley, approximately 80 km in length and up to 15 km wide. Undoubtedly the Gäuboden is the core region and centre of Early Neolithic settlement in southern Bavaria. The distribution of settlements there is structured by the edges of terraces and several streams. The only natural barrier is the river Isar, whose valley and delta cut off the easternmost part of the Gäuboden where it joins the Danube. To the south, the Gäuboden plain borders the Tertiärhügelland, a hilly region partially covered by loess and crossed by some streams and the broad Isar valley. LBK settlements follow the water courses and a major concentration is situated on a loess-covered terrace in the northern section of the middle Isar valley, near modern-day Landshut (Pechtl 2011, 54–55, fig. 1).

The whole region is one of the largest, most densely settled, and best explored LBK settlement zones overall (Zimmermann *et al*. 2004, 83, fig. 15). Together with the surrounding minor settlement zones, the Gäuboden and Tertiärhügelland yield about 570 known sites, more than 400 excavated ground plans of houses, and nearly500 burials (Hofmann *et al*.

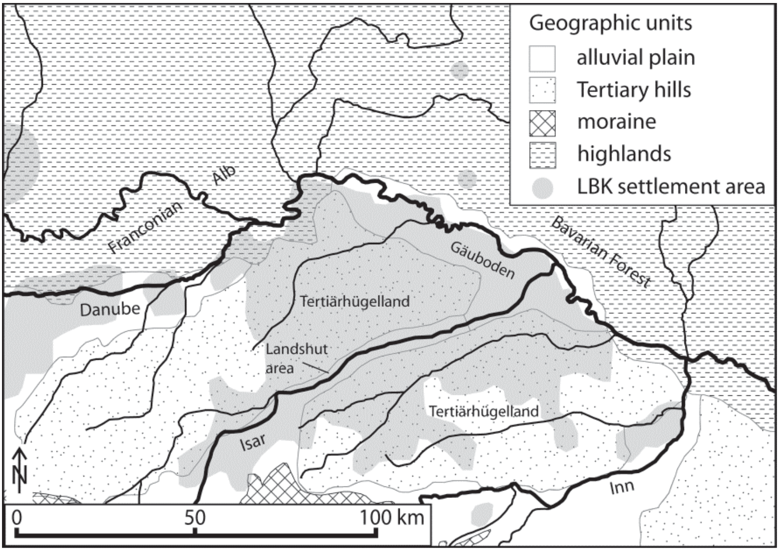
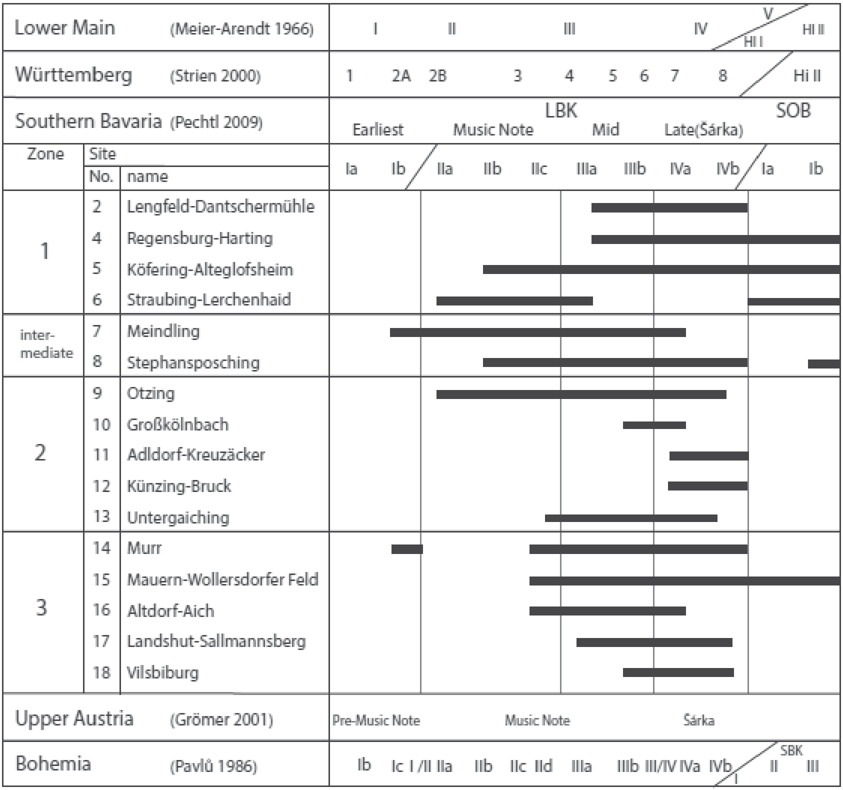


Fig. 11.1 Geographic units and distribution of LBK settlements in southern Bavaria.

2013, 208). As a result, an enormous amount of finds and features exist, but they are very heterogeneous.

For instance, mode of recovery, state of preservation, or the information available in the literature can all differ. For this reason, statistical comparisons of combinations of several criteria can only be carried out for very few and unevenly distributed sites, which does not allow to create a broader regional picture. It thus seems more appropriate to analyse possible regional variations by mapping different features and comparing the results. Since close dating is often impossible, the whole body of available material of phases II to IV of the regional sequence (Tab. 11.1, Pechtl 2009a, 61–114) is examined together. In absolute terms this might approximate a period of roughly 300 years. Only phase I (Earliest LBK) is excluded, since the sparse material relating to the first agricultural colonization in southern Bavaria shows many specific traits. The most important point is that there are differences in the intensity of archaeological activity throughout the research area, leading to disparity in the density of sources, but not to structural changes in the composition of finds assemblages. We can therefore be sure that the observed spatial differences approximate real differences in prehistory.

Tab. 11.1 Chronological scheme for southern Bavaria and its relation to adjacent regions. The duration of important sites is roughly estimated.



Region	Source	Phases
Lower Main	(Meier-Arendt 1966)	I II III IV V / HI I HI II
Württemberg	(Strien 2000)	1 2A 2B 3 4 5 6 7 8 / Hi II
Southern Bavaria	(Pechtl 2009)	LBK: Earliest, Music Note, Mid, Late(Šárka); SOB
		Ia Ib / IIa IIb IIc IIIa IIIb IVa IVb / Ia Ib
Upper Austria	(Grömer 2001)	Pre-Music Note, Music Note, Šárka
Bohemia	(Pavlů 1986)	Ib Ic I/II IIa IIb IIc IId IIIa IIIb III/IV IVa IVb / I SBK II III

Zone	Site No.	name
1	2	Lengfeld-Dantschermühle
	4	Regensburg-Harting
	5	Köfering-Alteglofsheim
	6	Straubing-Lerchenhaid
inter-mediate	7	Meindling
	8	Stephansposching
2	9	Otzing
	10	Großkölnbach
	11	Adldorf-Kreuzäcker
	12	Künzing-Bruck
	13	Untergaiching
3	14	Murr
	15	Mauern-Wollersdorfer Feld
	16	Altdorf-Aich
	17	Landshut-Sallmannsberg
	18	Vilsbiburg

Ceramic style

Searching for regional diversity, we usually first look at ceramic style. It is well known that LBK ceramics are characterized by a high proportion of decorated vessels and that there is an incredible variety of stylistic details (Pechtl 2015, 556–559). As in other regions, in the research area this has so far been mostly used for chronological analyses (e.g. Brink-Kloke 1992, 166–192; Herren 2003, 25–64; Pechtl 2009a, 61–114), but rarely for chorological studies (Pechtl 2011, 59–60). Over time, the stylistic development in the eastern Gäuboden is clearly and strongly influenced by the *Notenkopf* or Music Note style, which also dominates in nearby Bohemia and Austria. In contrast, in the western Gäuboden one can observe elements which point to Flomborn and subsequent styles typical for Württemberg and Franconia (Pechtl 2009a, 114–119; 2011, 59–60). But at the present state of research it is impossible to determine whether this is a gradual or an abrupt change of the type inventories and where any spatial boundaries are situated. Since chronological and chorological differences could well be intermixed, only a thorough statistical analysis of the entire material of the region could answer this question. Unfortunately, this is not feasible for this paper.

For the moment, only a distribution map of two contemporaneous stylistic attributes of the Later LBK (phase IV) can be presented (Fig. 11.2). The first attribute is the technique of using comb impressions for decorating vessels, which is typical for the Later LBK development in the Main and Rhine regions. The second one are decorative bands in the so-called "barbed wire" form, i.e. incised lines that are crossed by long dashes at a right angle, an element widely used in the Later LBK especially in Bohemia and Moravia. Although both types are particularly common in distant regions, the majority of the mapped finds in southern Bavaria are definitely of local manufacture. The map clearly shows three different zones within the research area. Zone 1 is situated in the north-west, along the upper Danube and in the Regensburg region in the western Gäuboden, where several sites produced finds of comb impressions, while barbed wire is rare. Zone 2 is located in the eastern Gäuboden around the confluence of Isar and Danube, where almost exclusively barbed wire is documented and occurs in high proportions. Zone 3 is to be found in the south, next to the middle Isar valley and reaching into the Tertiärhügelland. Here, both types are spatially intermixed. Unfortunately, no larger published assemblages of this phase exist for the central Gäuboden. The border between the two zones of the western and eastern Gäuboden most likely runs through this area, but cannot be pinpointed exactly. Interestingly, the same tripartition can be observed for ceramic decorations of the Earliest LBK (phase I) (Pechtl 2009b, 95, fig. 10), suggesting that these three stylistic zones existed throughout the whole LBK sequence.

LBK ceramics are thought to have been produced and used mostly at a household level and were rarely subject to long-distance exchange (Pechtl 2015, 560–562). Therefore, stylistic similarities and differences are possibly quite local signals and are due to the behaviour of the members of single households or household groups, not to any kind of market areas. Hence decoration styles could indicate shared aesthetic preferences and fashions within small social entities. Furthermore, decorated ceramics seem to have been a highly important medium of visual communication regarding social and cosmological aspects (Pechtl 2015, 566–568).

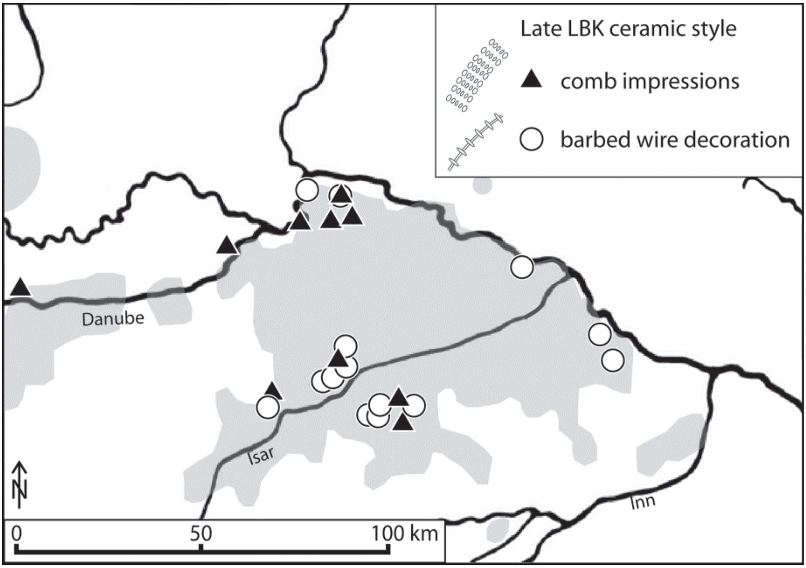


Fig. 11.2 Distribution of comb impressions and barbed wire decorations on Later LBK pottery in southern Bavaria. Grey: settlement area.

Correspondingly, stylistic differences point to the complex definition of multi-layered social identities (Lukes 2004, 19; Sommer 2001, 255; Strien 2005, 195; Whittle 1996, 171). The observed spatial differences within the research area thus indicate the existence of three social entities. Although boundaries cannot as yet be exactly determined, it is clear that the cores of these areas were spatially separated. These observations allow us to suggest the following conclusions:

1) In southern Bavaria at least three territorially defined social entities existed during the LBK. This means that individuals who lived together in certain areas also formed a social group.
2) These groups were constant over some 300 years, which is only possible if they perpetuated themselves by social learning.
3) Communication between the core regions of these groups was reduced, even if it is not clear whether we are dealing with gradual change or fixed boundaries.

Chert procurement

The supply of raw material for knapped industries largely relied on regionally available Jurassic cherts (Grillo 1997). Several deposits in the Swabian and Franconian Alb in the west of southern Bavaria allowed easy access (Gayck 2000, 250–296). Most prominent among these is the extraction site of Abensberg–Arnhofen (Rind 2014; Roth 2008). Extensive mining is attested and the chert is easily recognized due to its specific appearance. Thus, the dominance of this material in parts of the research area is well documented. In contrast, in the east of southern Bavaria there are only few and small outcrops of Jurassic formations containing workable cherts (Weißmüller 1996). The extraction site of Flintsbach–Hardt and possibly the outcrop of Meierhof–Weng seem to have been the most important sources of the kind of material collectively known as Ortenburg chert. While Ortenburg chert shows some typical traits, it can easily be confused with certain materials from the Franconian and Swabian Alb.

Decades of intensive field walking have enabled Manfred Schötz (1988) to establish the existence of two different distribution areas of chert raw materials in the valley of the Vils, a small stream running parallel to the Isar to the south-east. In the lower Vils valley, closer to the Danube, local Ortenburg chert dominates by far, and only occurs in form of nodules. In contrast, in the upper Vils valley mostly tabular chert is found, which originates from several equidistant sources to the west, often from Arnhofen. In his thorough study on the Arnhofen mine and the distribution of its chert, Georg Roth (2008) confirmed the separation of the Vils valley and pointed out an even more distinctive border in the exchange system of Arnhofen chert. His interpolation shows a dramatic decline of the proportion of Arnhofen material east of Straubing–Lerchenhaid (Roth 2008, 649, fig. 4.5). He therefore claimed that the Danube–Isar confluence in the eastern Gäuboden was not part of the Arnhofen exchange network, since the sources of Ortenburg chert were within the home range of people there (Roth 2008, 654, 700, fig. 4.13).

While this result is broadly speaking correct, two problems need to be pointed out. Firstly, the major assemblages from Meindling and Stephansposching were not included in this study, but show that either the fall-off of Arnhofen material was not that dramatic east of Straubing or that the position of the decline zone has been incorrectly calculated. Secondly, it would be important to find out where the Arnhofen fall-off is directly caused by competition with Ortenburg chert and where other factors are relevant. I have therefore created a new map indicating the proportion of Arnhofen and Ortenburg chert where known or at least reliably reconstructed (Fig. 11.3). Many problems still remain, since available data is heterogeneous (finds from field walking versus excavations, different investigators etc.). Furthermore, a study on the distribution of Ortenburg chert is lacking and there are huge gaps on the map. Data for settlements of phases II–IV are compiled from the literature (De Grooth 1992, 45, tab. 1; 1994; Ganslmeier 2002, 168, Abb. 61; Grillo 1997; Husty 1999, 57–58; Pechtl 2009a, 748, fig. 76; Roth 2008, 642–643, tab. 4.2; Schötz 1988, 12, tab.1)[2].

Looking at the map, the three different zones suggested by ceramic analysis are confirmed. Zone 1, including the extraction site of Arnhofen, is characterized by inventories dominated by Arnhofen chert. There seems to be no or only little material from Ortenburg. Lengfeld–Dantschermühle, where 18 % Ortenburg chert were identified (Grillo 1997, 77), might be an exception, but this also could be due to confusion with similar chert types of regional origin. Zone 2 in the eastern Gäuboden is marked by an absolute dominance of the local Ortenburg chert. No or very little Arnhofen chert was present. Again, there is little information from in between these zones. The sites of Meindling and Stephansposching west of the Isar are still largely dominated by Ortenburg chert and thus apparently belong to the eastern exchange network. However, they contain up to 20 % Arnhofen chert and it thus seems doubtful whether the sharp decline suggested by Roth (2008, 649, fig. 4.5) really exists further east. The data from Straubing–Lerchenhaid are of poor quality and should not be overinterpreted, but it seems that the proportion of Ortenburg material quickly drops off west of Meindling and although it still is important at Straubing–Lerchenhaid, this site seems to lie between zones 1 and 2 and probably has tighter connections to the east. Zone 3 along the middle Isar again contains sites with very strong connections to zone 1 (e.g. Vilshofen) and nearby sites with equally strong connections to zone 2, indicated by the dominance of either Arnhofen or Ortenburg chert. Remarkably, Landshut–Sallmannsberg is the only site showing a balance of the two chert types. In the Vils valley, quite a clear line divides sites with considerable proportions of Arnhofen chert, such as Hartspiert, form neighbouring sites largely lacking this material.

Commonly, two modes of chert supply are reconstructed for the LBK. Within a home range of roughly up to 30 km distance, people have the right to access the deposits and the opportunity to directly obtain their own raw material. Furthermore, these people can establish exchange networks to pass surplus down the line to relatives and friends of more distant regions. Both models also seem to apply to Arnhofen and Ortenburg chert (Roth 2008, 616–620, 658, 678; Zimmermann 1995, 69–71). Chert is not

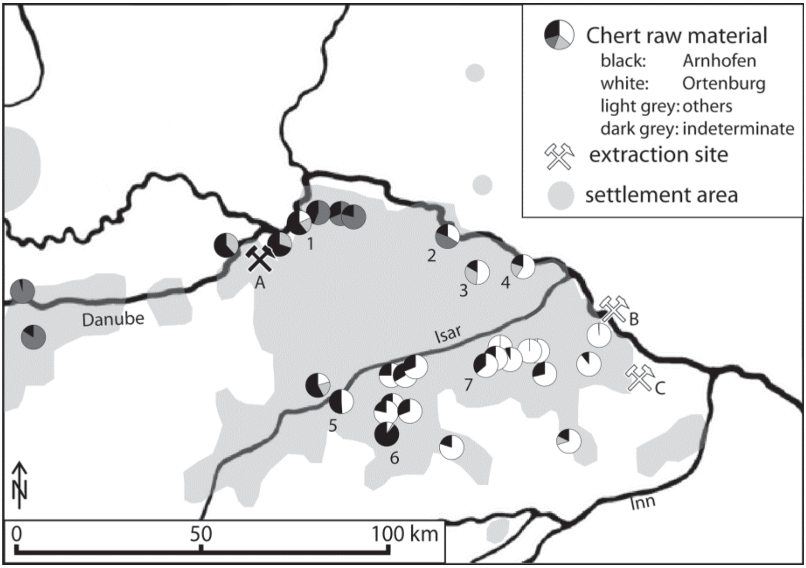


Fig. 11.3 Percentage of Arnhofen and Ortenburg chert in inventories of LBK settlements from phases II–IV in southern Bavaria. 1 Lengfeld–Dantschermühle; 2 Straubing–Lerchenhaid; 3 Meindling; 4 Stephansposching; 5 Landshut–Sallmannsberg; 6 Vilsbiburg; 7 Hartspiert. Extraction sites: A Abensberg–Arnhofen; B Flintsbach–Hardt; C Meierhof–Weng.

considered to be a prized commodity. Instead it was of relatively little value and passed on as an incidental addition in the course of direct social contacts (Zimmermann 1995, 131–132). At Stephansposching at least, exotic stone types tend to cluster in certain areas of the site, which indicates that supply strategies were probably based on single households (Pechtl 2009a, 164–165, 181). Following this line of argument, it is possible to take the proportions of certain raw materials in settlement inventories as proxies for the intensity of social communication between the inhabitants and non-local partners (Kerig 2010, 475–478; Zimmermann 2007). Thus, exchange networks represent regions of frequent communication, while the boundaries of exchange networks indicate the limits of social contacts. Access rights to raw material sources within the home range, as well as the high frequencies of certain cherts beyond the home range, indicate tightly bound but mutually exclusive social groups in the areas of zone 1 and zone 2. Due to a lack of data it is not possible to establish a clear border between zones 1 and 2 in the central Gäuboden. High proportions of Ortenburg chert in Meindling and Stephansposching indicate that the majority of the inhabitants had tight social connections to the east, and thus this region belongs to zone 2. Yet the Arnhofen chert also documents contacts to the west, albeit weaker. Maybe single households were oriented more in this direction. This is also true of Straubing–Lerchenhaid, but with more balanced contacts. Lerchenhaid can in some respects be considered as a hybrid site between zones 1 and 2. Zone 3 exhibits a remarkable pattern, since only Landshut–Sallmannsberg has balanced proportions of Arnhofen and Ortenburg chert, while all the other sites are clearly dominated by either the one or the other. This means that nearby settlements, and even different households within each settlement, belonged to different exchange networks and had different social affiliations. Zone 3 can be understood as a zone of overlap of the exchange networks of zone 1 and 2.

In conclusion, the spatial pattern observed in the ceramic decorations is confirmed in the chert distribution. Zones beyond which certain materials rarely travelled point to borders of exchange networks and therefore to zones of less intense social contacts. However, no clear boundary can be established in the central Gäuboden between zones 1 and 2. One has to bear in mind that chert may not have been of high value, but it was still indispensable. Since people in the central Gäuboden had no opportunity to obtain this material from nearby deposits, they needed to acquire it by exchange. Maybe due to this shortage people behaved more in line with economic necessities rather than pure social preferences.

Below-ground ovens

Ovens and fireplaces were sites of major technical, economic, and social importance, and therefore were probably omnipresent in LBK houses and maybe also in open spaces in the settlements. Regrettably, heavy erosion has generally destroyed the ancient walking surfaces of LBK settlements in southern Bavaria and beyond. Accordingly, fireplaces and ovens built at ground level or above have disappeared completely and we have no information concerning these fundamental installations. The only exceptions are fireplaces and ovens originally placed in deep depressions. While fireplaces in such situations are rare and probably the result of very specific events, below-ground ovens are frequently found in southern Bavaria. A minimum of 158 examples from 18 sites is known (Pechtl 2008, 69, 80–81). Typically a cavity was dug in the slope of a deep pit directly into the loess, so that a dome of about 1 m^2 and a height of perhaps 0.5 m was formed. The ground was often paved with gravel (Pechtl 2008, 65–67).

Mapping these subterranean ovens in southern Bavarian LBK settlements results in the by now well-known tripartite pattern (Fig. 11.4). In zone 1, just a single below-ground oven is attested. In contrast, in zone 2 they are very common and often found in higher numbers, for instance up to 69 ovens in the settlement of Otzing. Stephansposching and Meindling clearly are part of zone 2, but again the lack of data further west makes it impossible to locate a boundary there. In zone 3, below-ground ovens occur regularly, but often in low numbers. The only exception is the small settlement of Sallmannsberg with 19 examples (Brink-Kloke 1992, 112–114).

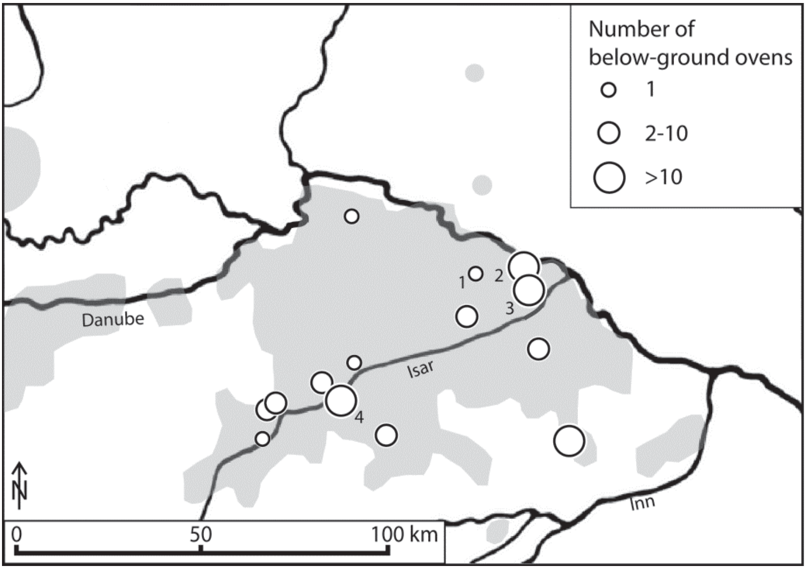


Fig. 11.4 Distribution of below-ground ovens in southern Bavarian LBK settlements. Grey: settlement area; 1 Meindling; 2 Stephansposching; 3 Otzing; 4 Landshut–Sallmannsberg.

Interpretation of the below-ground ovens is difficult. Their relatively low number and the most likely short average use-life suggest a special purpose for this type of oven, probably different from the expected "normal" ovens built above ground. Most likely is a connection with the communal preparation of special foods, maybe in the context of feasts (Pechtl 2008, 74–78). Correspondingly, the spatial distribution of below-ground ovens would reflect either certain economic practices or cultural, respectively ritual or social, practices. In either case, they probably fulfilled a communal function and thus the sharp boundaries hint at conscious distinctions between social groups concerning the practical application of pyrotechnology.

Orientation of houses

On the one hand, LBK house architecture follows strict standards, but on the other hand a mass of variants in execution can be observed (Coudart 1998). An obvious one among these is the variation of the orientation of the longitudinal axis of houses. To measure this attribute, the mean divergence of house orientation from north to west is used. Within the research area, 271 ground plans from 27 settlements of phases II–IV are sufficiently preserved to be included (Pechtl 2010, 51, tab. 1). A simple way of spatially analysing this feature is to map the mean orientation of the ground plans per settlement (Fig. 11.5). Once again, the regional tripartition shows up. In zone 1, all settlements have a minimum divergence of 10° to the west. Most notably, concerning this attribute Straubing–Lerchenhaid and Meindling are not only the easternmost settlements of zone 1, but also exhibit extreme divergences of, respectively, 25° and 22° to the west. Zone 2 is formed by settlements with mean divergence to the west of at most 5°, or even slight divergence to the east. Again, settlements next to the boundary tend to show extreme divergences, but this time to the east. Houses in Stephansposching have a mean divergence of −4°, those in Aiterhofen B20 of −3°. Within only about 8 km distance, between Straubing–Lerchenhaid and Aiterhofen B20 or between Meindling and Aiterhofen B20, the mean divergence changes by respectively 28° and 25°. Settlements in zone 3 again belong to either of the two orientation groups, but extreme divergences are not present. However, nearby sites sometimes exhibit strong differences, for instance houses in Altdorf–Aich are strongly oriented to the west (19°), while 2 km away in Altdorf–Pfettrach the divergence is only 7°. Lack of data prevents us from locating the boundaries between zone 3 and zones 1 and 2.

As convincingly argued, the orientation of LBK houses does not depend on the geographic properties of settlement sites, such as topography or climatic conditions. Instead we must suppose a symbolic background of high cosmological or social significance (Mattheußer 1991). The idea that the main entrance at the southern narrow side is oriented towards the mythological place of origin is tempting in this context (Bradley 2001). Certainly the foundation of a new house was a highly important, well-considered ritual act. Obviously, orienting houses was not a matter of chance, but an integral part of these rites and therefore carried out accurately. Consequently, the orientation of a house is to be understood as an explicit symbol that is linked to the self-conception of the inhabitants. It is an expression of their identity and involved in the symbolic competition between social groups. It marks membership to social entities as well as boundaries to others. Especially in contact zones

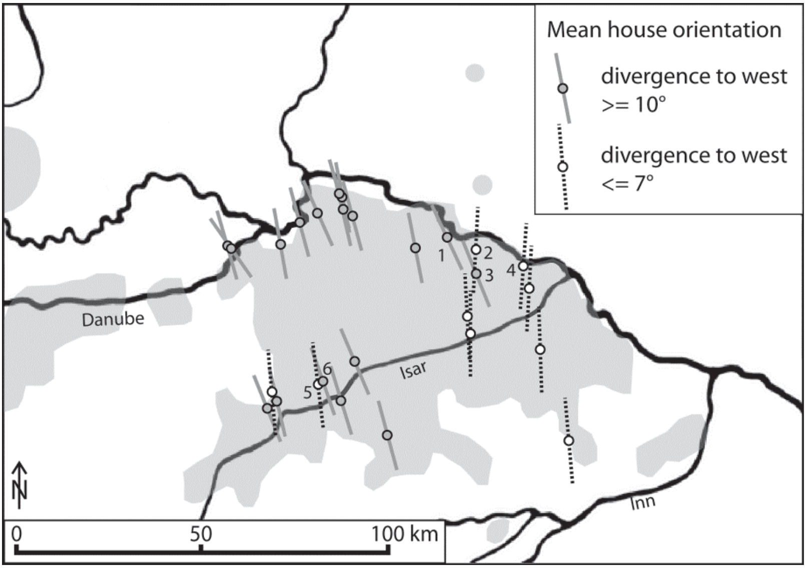


Fig. 11.5 Mean orientation of houses in southern Bavarian LBK settlements of phases II–IV. Grey: settlement area; 1 Straubing–Lerchenhaid, 2 Aiterhofen B20; 3 Meindling; 4 Stephansposching; 5 Altdorf–Pfettrach; 6 Altdorf–Aich.

the necessity of such a symbolic marker of identity was evidently felt, as shown by the more strongly emphasized distinctions in divergences. This can be observed in the boundary area between zones 1 and 2, for instance between Straubing–Lerchenhaid and Stephansposching, as well as in the obvious symbolic rivalry of neighbouring settlements in zone 3.

Monumental architecture

In phases II–IV, LBK architecture in southern Bavaria generated two types of monumental structures (Pechtl 2009c; 2010, 46–48). The first type are houses of an extraordinary size, arbitrarily defined as the longest 10 %. Within a dataset comprising 328 ground plans from all over the LBK distribution, this resulted in a minimum length of more than 33.0 m (Pechtl 2009c, 186–188). In southern Bavaria, 80 ground plans are sufficiently preserved to determine their total length. Sixteen ground plans from seven settlements belong to the category of extremely long houses (Pechtl 2009c, 196, fig. 1). The second type of monumental architecture

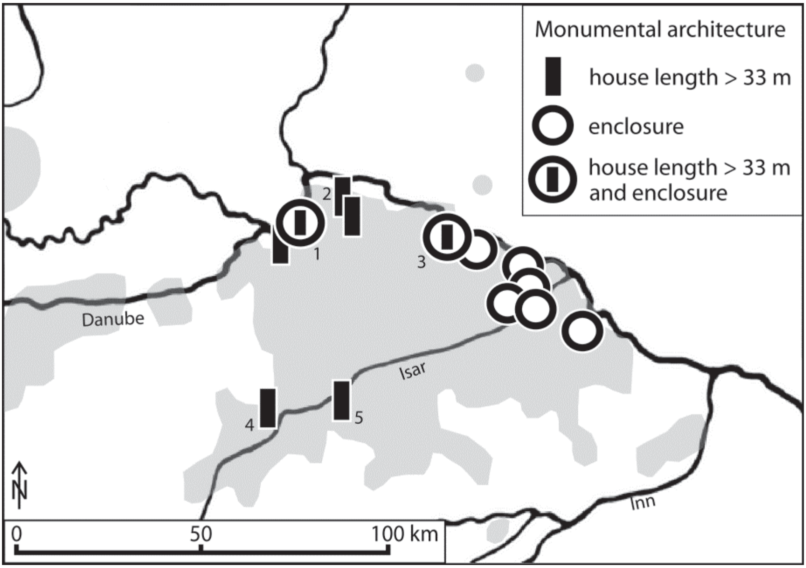


Fig. 11.6 Distribution of monumental architecture in form of extremely long houses (> 33 m) and enclosures in southern Bavarian LBK settlements of phases II–IV. Grey: settlement area; 1 Lengfeld–Dantschermühle; 2 Regensburg–Harting; 3 Straubing–Lerchenhaid; 4 Murr; 5 Landshut–Sallmannsberg.

are enclosures. Ten enclosures were documented in eight sites in southern Bavaria (Pechtl 2011, 61).

Mapping both features together leads to interesting results (Fig. 11.6). Extremely long houses exclusively occur in the western part of the research area. Most of them cluster in zone 1, where the site of Regensburg–Harting alone yielded eight examples. The easternmost structure was uncovered in Straubing–Lerchenhaid. Further examples are two more houses in Murr and Landshut–Sallmannsberg in the area of zone 3. Therefore, the type occurs in zone 3, but only rarely. Not a single extremely long house was detected in the eastern Gäuboden, although the majority of all known ground plans are located there. Zone 2 is obviously free of this type of monumental architecture. The distribution of enclosures draws a complementary picture, as there is a dense accumulation of such sites in the eastern Gäuboden, Straubing–Lerchenhaid being the westernmost one. No enclosure is known from zone 3 and just a single one from Lengfeld–Dantschermühle in zone 1. The two types of monumental architecture largely exclude one another. Only in Lengfeld–Dantschermühle and in Straubing–Lerchenhaid do both types occur together at the same site, the latter settlement is situated at the border of zones 1 and 2.

Houses are generally thought to be an important medium of social competition, and this certainly holds true for the elaborate house architecture of the LBK. Especially the length of the houses may be an adequate indicator of prestige (Hodder 1990, 128–129; Pechtl 2009c, 188). Erection of an extraordinarily long house thus was a powerful symbolic act to create or heighten a household’s prestige, especially that of the head of the household. Competition for prestige related to the length of houses particularly took place among different households of the same settlement or the immediate surroundings. Since more labour was required for building than the future inhabitants themselves could contribute, it is supposed that neighbours, friends, and especially relatives were also drafted in (Pechtl 2009a, 399–401, 411–413). This leads to the assumption that in regions where increased house length was a prestige indicator, the level of the household and maybe the lineage were primary foci of social identity (Pechtl 2009c, 194). Even more than the erection of houses, the building of enclosures was an enormous investment of labour and definitely a powerful symbolic act (Pechtl 2009a, 473–481). This implies activating and organizing the labour of many more people than are necessary for house building. That means that neither a household community nor a single lineage was sufficient. More probably, whole villages were involved, maybe under the leadership of Big Men (Pechtl 2009a, 477–479; 2009c, 194). In Straubing–Lerchenhaid, three overlapping enclosures were built in a short time (Schmotz 1997, 129–138), suggesting that the act of building was more important than the actual use of the completed construction. The multitude of short-lived enclosures in a small region again implies that competing for prestige was a major reason for building such monuments. But the actors and beneficiaries of this prestige can be found at a different level of social integration. It is no longer households or lineages who are emphasized, but villages and maybe political leaders such as Big Men. Maybe this also provides an indication of different levels of socio-political organization (Pechtl 2009c, 194–195).

In sum, the inhabitants of the three southern Bavarian zones not only used different media for prestige competition, but also focused their efforts on different levels of social identity. The case of Straubing–Lerchenhaid is particularly interesting and illustrates the complicated situation at the border between zones 1 and 2. On the one hand, the unique occurrence of three enclosures at one site stresses the ostentatious performance of the customs of zone 2, while on the other hand the coexistence of the enclosures and an extremely long house indicates the presence of different modes of prestige behaviour in one settlement.

Core regions and boundaries

The distribution maps of the different attributes analysed reveal very similar patterns (Figs 11.2–11.6). Therefore, within the areas labelled as zones 1, 2, and 3 we find not only concentrations of any one attribute on its own, but rather the distributions of the different attributes coincide. Due to the incomplete state of knowledge on the majority of sites, such co-occurrences can only be directly testified in a few cases (Tab. 11.2). However, they can surely be considered as typical for many other sites, too. This allows the definition of core regions, where certain combinations of attributes typically occur, while other attributes seem intrusive (Fig. 11.7).

The core of zone 1 covers the environs of the upper Danube between Mitterfecking and Köfering–Alteglofsheim, including the westernmost part of the Gäuboden plain as well as the hilly areas further to the west.
The core of zone 2 comprises the eastern part of the Gäuboden plain and the adjacent areas of the Tertiärhügelland, especially the lower valleys of the Isar and Vils. A clear boundary between these two core regions, somewhere in the central Gäuboden, cannot currently be identified. Firstly, only few assemblages are available in that region, and secondly, a certain blending of the typical attribute combinations of zones 1 and 2 occurs. While Stephansposching, Otzing, and Großköllnbach definitely belong to the core of zone 2, the nearby sites of Straubing–Lerchenhaid and Meindling exhibit a mixture of "western" and "eastern" attributes and thus point to the existence of an intermediate zone. Remarkably, the mixing was apparently not random, since indicators exist for consciously emphasising certain attributes, such as the extreme orientation of houses or repeated enclosure building. This, alongside the observed coexistence of enclosures and an extremely long house at the site of Straubing–Lerchenhaid, could be interpreted as a special phenomenon in a boundary situation. All in all, there is a predominance of eastern attributes in the intermediate zone.

Tab. 11.2 Combination table of regionally typical features. Grey shades: typical combinations of features in different zones; ?: no data; no entry: feature absent; grey data: percentage of less frequently used chert raw material.

zone	site		comb impressi-ones	Arnhofen chert dominat (% of Arnhofen)	mean divergence of house orientation to west >= 10°	extremely long houses > 33.0 m (number)	barbed wire decoration	Ortenburg chert dominant (% of Ortenburg)	below-ground ovens (number)	mean divergence of house orientation to west < 7°	enclosure (number)
	No.	name									
zone 1	1	Mitterfecking	?	70	10		?	?			
	2	Lengfeld-Dantschermühle	few	61	15	1		(18)			1
	3	Bad Abbach	?	43	24		?	?			
	4	Regensburg-Harting	frequent	?	13	8	few	?			
	5	Köfering-Alteglofsheim	few	21	16	3		?	1		
intermediate zone	6	Straubing-Lerchenhaid		(19)	25	1		34			3
	7	Meindling	?	(17)	22		?	51	1		
zone 2	8	Stephansposching		(20)			few	59	18	-4	1
	9	Otzing	?	?			?	?	69	-3	1
	10	Großkölnbach	?	?			?	?	10	3	
	11	Adldorf-Kreuzäcker		(0)				100	3	2	
	12	Künzing-Bruck	present	(1)	?	?	present	99	?	?	?
	13	Untergaiching	?	(18)			?	70	15	5	
zone 3	14	Murr		?	>20	1	single	?	3		
	15	Mauern-Wollersdorfer Feld	single	-4				?	5	5	
	16	Altdorf-Aich	?	58	19		?	(20)	3		
	17	Landshut-Sallmannsberg		51	17	1	frequent	(49)	19		
	18	Vilsbiburg		89	15			(8)	2		

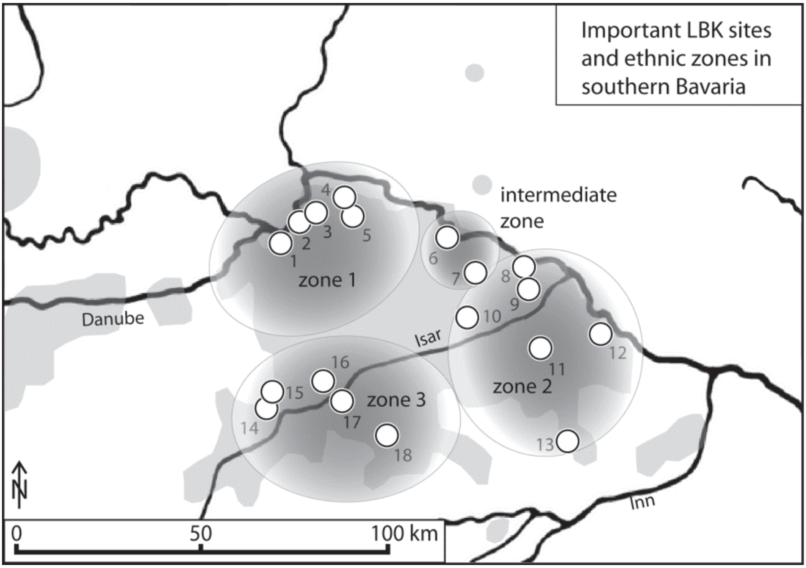


Fig. 11.7 Important sites and ethnic territories in phases II–IV of the southern Bavarian LBK. Grey: settlement area; ovals: schematic indication of different ethnic zones; site names are given in Tab. 11.2.

The middle Isar valley and adjacent parts of the Tertiärhügelland can be identified as the core of zone 3. Typical for this region is the coexistence of attributes otherwise typical for either zone 1 or zone 2. However, no new homogeneous combination of attributes developed in this area. Rather, nearby settlements show strong differences and created quite individual combinations of attributes. However, there was no admixture of behaviours within any given attribute. For instance, there are no compromises of house orientation; with the exception of Landshut–Sallmannsberg there was always a clear preference either for Arnhofen or for Ortenburg chert; and there is no combination of comb impressions and barbed wire decoration on the same vessel. Again, boundaries to the other zones cannot be drawn, since there are large areas for which we currently have no information.

Summing up, three different cultural core regions can be defined. There is considerable blurring of boundaries, and at least between zones 1 and 2 an intermediate zone is postulated. Most importantly, all three zones comprise a variety of landscapes, including river plains and hilly regions. Hence the spatial extent of the three core regions and location of their boundaries are not linked to physical geography. In particular, zone 1 and zone 2 both extend into the large plain of the Gäuboden. The intermediate zone between them is situated right in the middle of this fertile and densely settled area.

Results

An “ethnic” interpretation

As shown above, there are several attributes throughout phases II–IV of the southern Bavarian LBK that spatially cluster in similar ways, and probably it would be easy to find more of them. It has been argued that this pattern is neither due to any landscape conditions nor simply coincidental. Purely economic reasons can also be excluded, and nor is this simply an artefact of preservation and research strategies.

It is important to note that the examples are connected with very different spheres of the lives of the Neolithic settlers. For instance, chert exchange and use have a primarily economic and technological everyday background, predominantly take place during routine personal communication with relatives and allies, are conducted at a household level, and supposedly have male connotations (Zimmermann 2007, 92). Pottery production and use are assumed to take place mostly at the household level and to be part of the female sphere. Although ceramic vessels normally are everyday objects, the decorations are not only aesthetic statements by the potters, but bear highly symbolic content with social and cosmological significance. Thus, ceramic production was carried out in a field of tension between personal freedom and social control through families and elders (Pechtl 2015). Below-ground ovens could be communal installations, were not in routine use, and may be linked to the preparation of special foods and to important feasts. The orientation of houses was certainly established during a ritual act under strong social control not only by the future household group but also by relatives and neighbours. House orientation certainly had symbolic meaning and was a strong public statement of identity. Creating monumental architecture involved an even wider community and therefore had great social significance. In the case of enclosures, activity was likely not confined to kin groups, but involved larger socio-political entities such as whole villages.

The chosen examples belong to very different fields of acting, living, and thinking, privately as well as publicly. Often they involve symbolic action that must be understood as statement about ideology and identity. Protagonists can be individual persons and household groups, sometimes probably neighbours, kin groups, and socio-political entities such as villages.

All this shows that the observed spatial patterns are not random, but reflect the existence of territory-based, group-specific differences in the ways of living and thinking. In other words, zone 1 and zone 2 represent two different cultural areas within the LBK in southern Bavaria. While much communication and exchange takes place within these cultural areas, between them communication is reduced, as the discontinuity of chert exchange indicates. Even more striking is the over-emphasis on symbolic markers of identity such as house orientation taking place adjacent to the boundary. Unquestionably, people wanted to be different, so this is not only a cultural border, but also a boundary of group identity.

To further discuss the nature of the groups inhabiting zones 1 and 2, some additional remarks can be made. Firstly, the size of the groups involved has to be taken into account. For an area covering chiefly zone 1 and 3, a mean population of approximately 5500 persons is calculated (Roth 2008, 700, fig. 4.13). A similar population size is also reconstructed for the eastern part of the Gäuboden and adjacent parts of the Tertiärhügelland, roughly the area of zone 1 plus the intermediate zone (Pechtl 2012, 138–139). Thus the social groups under discussion reached a considerable size. Secondly, the groups and their territories are quite stable for approximately 300 years, throughout the duration of phases II–IV. Therefore, economic, social, and symbolic behaviour are characterized by remarkable long-term stability[3]. This is only possible if the continuous perpetuation of these systems is guaranteed by effective means of social learning. This indicates that people in both zones developed distinctive forms of habitus. Thirdly, the different house orientations document two groups of people behaving differently in symbolic aspects. Keeping in mind the idea that house orientation could be linked to the place of postulated origin (Bradley 2001), this possibly hints at a very important element of self-conception. While proof for this is lacking, it might still indicate the existence of two different groups, each claiming a separate origin. Fourthly, the emergence of zones 1–3 can potentially be directly linked to the LBK colonization history of southern Bavaria (Pechtl 2009b, 88–96, 102–104). Current data indicate that the upper Danube valley, which includes zone 1, was the first region to be colonized within the research area, roughly around 5400 cal BC during the older horizon of LBK phase I. Colonists probably moved into this region from Franconia in the north-west. At the beginning of the younger horizon of phase I, colonization spread to the middle Isar valley, that is to zone 3. Already during phase I, the use of specific symbols connects zones 1 and 3 to the

Swabian settlement regions to the west. Around 5300 cal BC, another wave of colonization from Austria and maybe also from Bohemia reached southern Bavaria, this time coming from the east. This wave, right at the transition from phase I to phase II, is largely linked to the Music Note (*Notenkopf*) style and resulted in the colonization of the eastern parts of the research area. Zone 2 was now settled for the first time and new settlements in zone 3 were evidently also established. A more or less linear boundary could have emerged where the two colonization waves met in the central Gäuboden. In contrast, in the middle Isar valley a kind of overlap led to the small-scale intertwining of settlements belonging to both groups. Thus, the colonization history of zone 3 could be the reason why discourse on identity was more complicated there than in the intermediate zone in the Gäuboden. Again, people linked with the traditions of either zone 1 or zone 2 explicitly worked on defining their identity, but they found slightly divergent solutions. This could be due to the very special situation that the settlements of either tradition were neither situated in homogeneous blocks separated by clear boundaries, nor created a zone of gradual spatial change, but were intermingled.

The evidence goes far beyond typological differences in material culture, as it comprises differences in social practices, rites, and communication patterns, and even suggests that these emic self-perceptions could be related to different origins, as indicated by colonization history. Thus, the cultural groups discussed here fulfil all the requirements listed in the introduction as characteristics of ethnic groups. A minimum of two social groups can be proposed, which are largely territory-based and clearly form a level above settlements and settlement groups. While it remains difficult to differentiate between certain kin structures such as clans and ethnic groups, in this case the size argues strongly for the latter. Since colonization history and the emphasis on identity at the boundaries speak for a certain competition, we could even consider some form of loose socio-political organization. The term “tribes” seems appropriate here.

Consequences for daily life

Archaeological evidence indicates the existence of different tribes in the southern Bavarian LBK. But the consequences of such an imagined entity for daily life should not be overestimated. The record of material culture shows differences in many areas of life and we can also expect further differences in immaterial culture, such as language. Ethnic identity to some extent helps to structure social life, and cultural homogeneity can induce a feeling of security. Furthermore, tribal structures might regulate access to resources, as well as provide solidarity and political representation for members (Kerig 2010, 481).

However, ethnic identity is just one level of social organization among many others. For instance, tribal structures do not prevent internal struggles for prestige and power between sub-units. The erection of monumental houses and enclosures clearly indicates such competition between household groups, respectively villages (Pechtl 2009c). On the other hand, the two ethnic groups in southern Bavaria share many similarities, joining them together into a bigger unit. For example, ceramic decoration throughout phases II–IV is largely characterized by superimposed structuring motives, allowing the definition of a common regional style (Hofmann *et al*. 2013, 212; Pechtl 2009a, 114). Equally typical for this region is the "Bavarian J" post setting in houses, indicating strong architectural commonality (Hofmann *et al*. 2013, 213; Pechtl 2010, 44, fig. 6).

In an ethnically structured environment, everybody apparently needs to take up a position towards such social networks. For instance, even pottery production or house building imply decisions about the application of ethnically important symbols. As a result, we can identify individuals and household groups as actors, but probably also villages and political leaders were active in this respect. Hence, social pressure inevitably arises, but it was not strong enough to produce total homogeneity. For example, the inhabitants of Meindling, which is situated in the boundary zone, clearly demonstrate their symbolic connection to zone 1 through house orientation, but economically it was easier to obtain Ortenburg chert from zone 2 than Arnhofen chert from zone 1. Similar situations apparently were the norm in zone 3. The boundaries were thus more symbolic in nature and caused only limited reduction of communication. Even enduring mobility of individuals or household groups seems possible. For instance, in many settlements single houses deviate strongly from the local mean orientation and thus symbolically refer to another ethnic group (Pechtl 2009a, 783, Abb. 115). Apparently, such diverging behaviour was accepted by neighbours and ethnic minorities were present within settlements.

Conclusions

Overall, the hypothesis of tribal structures existing in the southern Bavarian LBK seems well-founded. This is in accord with similar findings in other regions, namely in the Rhine–Main region, in Westphalia, and in

Alsace (Jeunesse 1994, 5–14; Kerig 2010; Zimmermann 2007). As in these cases, the tribal boundaries are not related to major natural barriers. So far, it is not possible to determine whether ethnic grouping is a phenomenon inherent to the entire LBK or just a regional peculiarity. In any case, this could be a way of interpreting the up to now rather abstract and inanimate "regional groups" within the LBK—provided that it is tested for each particular case that these groups are more than simply stylistic regions. Boundaries between such potential tribes should not be misunderstood as "iron curtains", but are much more like semi-permeable membranes, open to communication, interaction, and even immigration. Mixed settlements as well as mixed settlement regions are present. The importance of the ethnic level of identity to LBK farmers is currently hard to estimate. There are many graded levels of identity, and ethnicity is just one of them. Its actual importance might always have depended on the specific situation and the interaction partners.

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Notes

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[1] In this contribution, "culture" on its own is used as a general term for all material and immaterial aspects of people's ways of life (in contrast for instance to "material culture" alone). The use of the term "LBK culture" follows the current messy archaeological usage, which implies that the material culture does reflect a larger socio-cultural unit. Indeed, this is partly what this contribution sets out to argue.

[2] Correction factors after Roth (2008, 642–643, tab. 4.2) were applied to parts of the material.

[3] Long-term stability of ethnic entities over several centuries might not be standard, but is well documented historically. For instance in the Americas there are several cases of ethnic groups whose first contact with Europeans took place between the sixteenth and early nineteenth century AD and who are still existent. Among these are the Mapuche in Patagonia, Aymara- and Quechua-speaking communities in the Andes, or the Shipipo-Conibo in the Amazonian lowlands of South America. In North America this is true for different Puebloans, many tribes of the Plains and the plateau, or the members of the Iroquois confederation (Ganteaume 2010, 21–24, 53, 73–74, 123–125, 141, 167–173).

CHAPTER TWELVE

ASPECTS OF LBK REGIONALITY IN THE MOSELLE AREA: THE LUXEMBOURG CASE STUDY

ANNE HAUZEUR

Introduction

The Middle Moselle area appears as a link between two parts of the North-West LBK. This can be seen through aspects of material culture, mainly some features in the lithic assemblages and the ceramic decoration style. The case study of the LBK settlements in the Great-Duchy of Luxembourg presented here aims to underline the differences which constitute this diversity within the north-west stylistic province of the LBK, and to suggest which aspects can be considered as the results of economic constraints, weight of tradition, or real identity features. To achieve this, elements of divergence from the common background have been defined, i.e. those which can be considered as different in frequency, quality, style, etc. These differ from what has been accepted as the norm for the North-West LBK. This North-West LBK "package" had been defined based on the common acceptance of several cultural elements, mainly the pottery decoration style. It was first proposed by, amongst others, Werner Buttler (1938, 28) and developed further by several authors such as Walter Meier-Arendt (1972) or Margarete Dohrn-Ihmig (1976). As erosion and partial excavation of settlements are limiting factors, its emphasis is mainly on aspects of material culture such as house plans, siliceous tools (scrapers, arrowheads, splintered pieces), and certain ceramic style components.

Over the last decades, large-scale excavations in Luxembourg improved our understanding of the regional components of the LBK in the Moselle area (Hauzeur 2006). They have underlined the area's affiliation with the Rhine–Main group, mixed with "identity features" from neighbouring regions. One of the remaining questions is to interpret those elements of singularity in terms of lineage, influence, or exchange.

Based on these data, it will be demonstrated here that the Middle Moselle area appears as the geographical limit of south-eastern influence, discernible but loose enough to allow exchanges of goods or ideas with the neighbouring regions, including the Rhine–Meuse area.

General background

The Moselle area, and especially its middle and lower parts, belongs to the stylistic province of the North-West Linear Pottery culture, according to Christian Jeunesse's (1995) definition. But this is not generally accepted. Indeed, Walter Meier-Arendt (1972) earlier proposed a "Middle Rhine–Main" group mostly because of the stylistic similarities between these two regions. The putative border was located in the Moselle–Lahn area, excluding that region from the actual North-West group. Another dimension of cultural interaction was proposed by Jens Lüning (1991). The main valleys, such as the Rhine basin, are the vectors of diffusion, with the Moselle connected with the Rhine–Main–Neckar area. The geographical position of the Moselle LBK at the fringe of different clusters makes it interesting to study which aspects of material culture were influenced by neighbours or remained anchored in a root tradition. The case study of the LBK settlements in the Great-Duchy of Luxembourg illustrates a dichotomous intermediate position between the southern regions, such as the Main and the Neckar valleys, and the Rhine–Meuse regions in the north (part of Germany, the Netherlands, and Belgium; Fig. 12.1).

The distinction between the North-West LBK package and regional identity characteristics requires to draw out the elements of divergence. Those that are defined by their recurrent appearance amongst the assemblages of a settlement or even a household are more likely to be long-term local or regional cultural characteristics. On the other hand, isolated occurrences would suggest other interpretations, such as contacts or exchanges with neighbours. Raw materials serve as a good example to illustrate the differences between a regional characteristic and an extra-regional relation. The common background is formed by the Upper Cretaceous imported flints from the Belgian–Dutch area, where some rarer elements, like the so-called greenish-grey "Rullen type" can be collected at the same time and place. Also, rarer artefacts of Tertiary flint (Bartonian type) have been found in the Luxembourg assemblages. In the former case, the Rullen type is not considered as indicative of extra-regional contact, as the outcrops or blocs can be collected in the same area in which the more common raw material is also procured. In contrast, the second case indicates either a relation with neighbours who have this raw material (here some settlements in Lorraine) or extra-regional contacts with exchanges of goods.

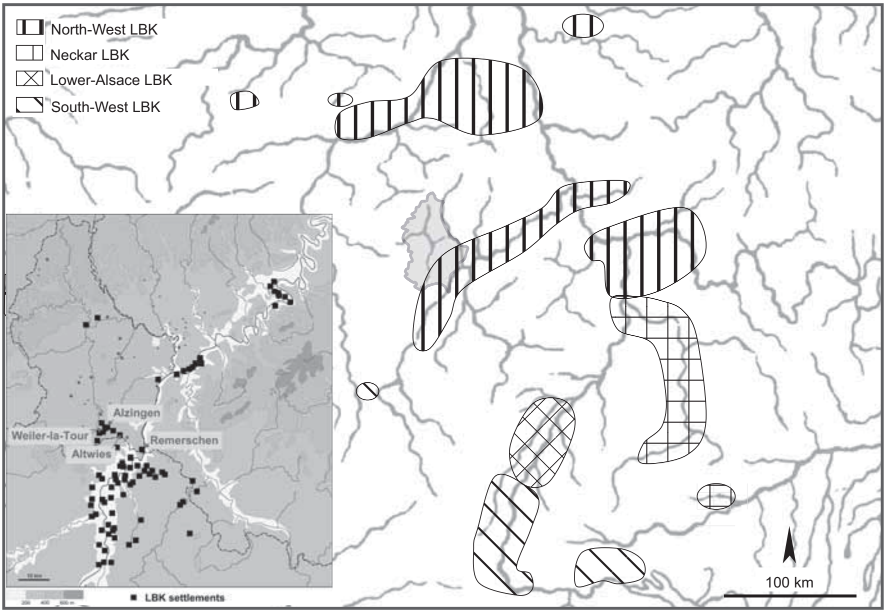


Fig. 12.1 Map showing the stylistic groups of the North-West LBK according to Jeunesse (1995) and excavated LBK settlements in the Moselle basin in Luxembourg.

The Luxembourg LBK assemblage currently consists of material from a dozen sites, five of which have been partially excavated. The following considerations rest upon the most important assemblages and the best-represented period, i.e. the recent LBK, phases IIc–IId (represented at Remerschen–“Schengerwies”, Altwies–“Op dem Boesch”, and Alzingen–“Grossfeld”; all details can be found in Hauzeur 2006). Selected examples of architecture, the lithic toolkit, and ceramic stylistic components will be discussed here to illustrate the diversity inside the North-West province. It should be mentioned that the comparisons are based on available data, which differ in quality and recording details.[1]

Architectural specificity

At the time of the study, 21 house plans were available for the Luxembourg territory in a more or less satisfactory state of preservation. One sensitive difference to the North-West stylistic province consists of the balance between the presence or absence of the foundation trench at the rear of the houses. Although the results given here only concern bipartite houses, the pattern can be extended to tripartite houses and the new houses discovered in 2013 (Hauzeur and Valotteau 2013), which are older. Until now, nearly all the house plans from the recent LBK in Luxembourg show a foundation trench at the rear (Fig. 12.2). One example without trench is the oldest known house at Weiler-la-Tour, which belongs to LBK IIa–IIb, and another one was found at Alzingen (LBK IId). The large predominance of this house type with trench is also a common feature of LBK architecture along the Neckar and in Bavaria and is more likely to be a long-term local or regional cultural characteristic (detailed corpus with references in Hauzeur 2006). On the contrary, houses without trenches make up the majority in the South-West province (the Upper Rhine area and the central part of the Paris Basin; Hauzeur 2006). The Rhine–Meuse area takes up an intermediate position, with two thirds of the house plans without trenches (Fig. 12.2). This could be explained by an influence from, or links with, the Paris Basin during the most recent phases of the LBK.

The proportion is inverted in the north French Lorraine, with roughly two thirds of the house plans showing a trench (Blouet *et al.* 2013, vol. 2, 31 f.). The houses without trench are located in Ay-sur-Moselle and the very late LBK settlements of Ennery and Tremery. One of the explanations is doubtless also the influence of the core of the Paris Basin, which is clearly visible in raw material procurement (Blouet *et al.* 2007) and the original decoration style on pots from settlements such as Ennery and Tremery (Blouet *et al.* 2013). This illustrates a transversal west–east link with neighbouring outsiders. A clear bipartition of Lorraine is confirmed by the fact that the complete houses at Marainville-sur-Madon have no foundation trench and—stylistically speaking—belong to the South-West group.

The Luxembourg data indicates a stronger link with the south-eastern regions, and as such with stylistic provinces other than its own North-Western group. Wall trenches are a technical characteristic which cannot be considered simply as an answer to climate constraints or similar factors. Settlements on plateaux—for example on the Luxembourg sandstone plateau or the loess plateau of the Hesbaye in Belgium—are subjected to the same kind of humid temperate climate, but nevertheless differ in this respect. Thus, moving beyond a technical feature, part of a cultural identity is expressed.

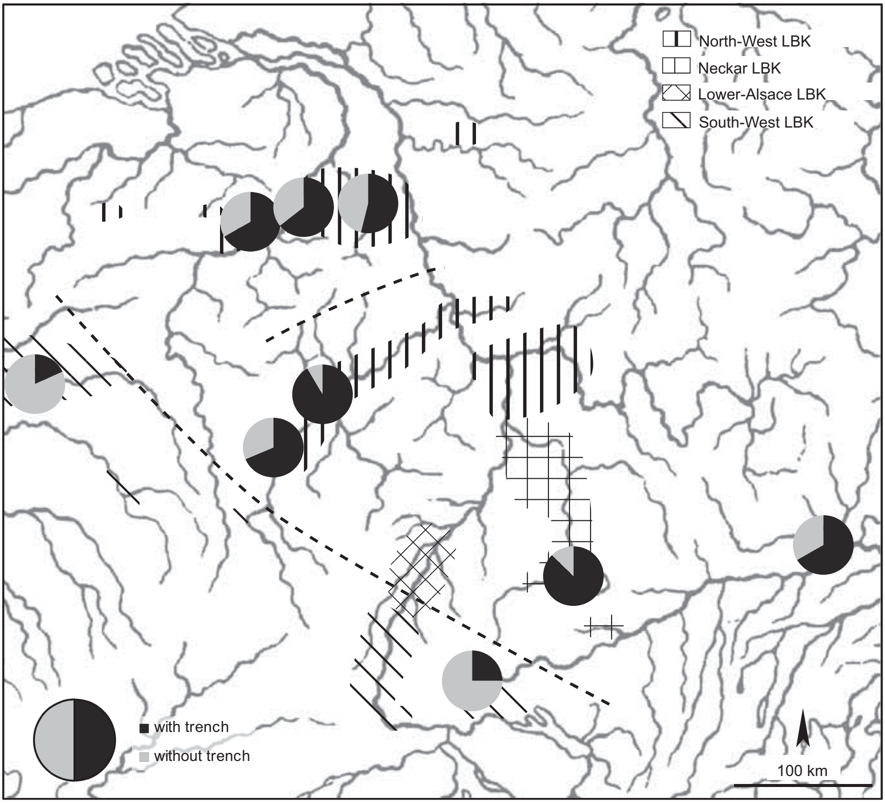


Fig. 12.2 Types of house plan with the presence or absence of a wall trench. Data based on Hauzeur (2006), additions for the French Lorraine from Blouet *et al.* (2013).

A similar conclusion can be reached for the shape of the houses. They are quite systematically built on a rectangular or pseudo-rectangular plan (in ten out of 12 of the better-preserved settlements), much more frequently than in the northern part of the North-West LBK and in the South-West LBK. Those regions have a higher proportion of trapezoidal house plans, respectively about one third (Hesbaye, Graetheide) and two thirds (central Paris Basin). In the latter area, rectangular and pseudo-rectangular shapes are attested for only about a quarter of the available houses. These noticeable divergences constitute a first point of distinction between the north and the south part of the North-West province.

Differences in the lithic toolkit

Several differences can be observed in the toolkit of different areas of the western LBK. A first obvious difference is the general size of the chipped stone tools. As good-quality flint sources are lacking in the Moselle basin, the tools show reduced dimensions. They indicate a process of use/reuse cycles until the very end of their possible use lives. Several are then transformed into splintered pieces, representing as much as a third of the total toolkit in the Middle Moselle (Hauzeur 2006, pl. 195–196). In this case, it appears obvious that the toolkit generally shows a lower average size compared to those coming from settlements on a Cretaceous substrate, such as the Belgian and Dutch Meuse basin (in closer proximity to raw material outcrops). A concrete example is the average length of the scrapers (illustrated in Tab. 12.1), which is much lower for Luxembourg and south-west Germany than for areas such as Belgium or the German Rhineland.

Tab. 12.1 Scraper length at selected sites and regions in the western LBK.

Site name	Scraper length	References
Aubechies (Hainaut, BE)	around 3–4 cm	Allard 2005
Vaux-et-Borset (Hesbaye, BE)	4.1 cm	Allard 2005
Verlaine (Hesbaye, BE)	around 4 cm	Allard 2005
Langweiler 8 (North Rhine-Westphalia, GE)	3.7 cm	Hauzeur 2006
Bernkastel-Wittlich (Saarland, GE)	3.2 cm	Hauzeur 2006
Luxembourg	3.2 cm	Hauzeur 2006
Kraichgau (Baden-Württemberg, GE)	2.6 cm	Hauzeur 2006

Again, this difference marks the distinction between the north and the south part of the North-West stylistic province and reinforces the link with the south-eastern regions. Yet this is not because of the weight of tradition, but because of similar economic constraints due to the lack of good-quality siliceous raw materials in large enough nodules. Such a constraint is also observed for the splintered pieces. They are systematically smaller in the Luxembourg assemblages (less than 3 cm on average) than for example in the Aldenhovener Platte region (4–5 cm on average). The first explanation that springs to mind is naturally the lack of flint, maybe combined with a functional component (used as small wedges for woodworking?), or even a technical tradition (for which kind of use?). These examples in any case demonstrate how difficult it is to distinguish between economic factors and cultural tradition or identity, and the two could anyway be linked.

Another difference is visible in the composition of the toolkit in the different regions. One explanation of course is the characteristics of each household or part of a village. To avoid the distortions introduced by this individual factor and by the lack of fully excavated settlements, the scale of analysis has been established at the regional level by grouping several settlements with available data in the same area (Hauzeur 2006, 288). The resulting map for the North-West province and the Neckar LBK (Fig. 12.3) illustrates the similarities between assemblages of the Neckar province and the southern part of the North-West province, which are distinct from those of the Rhine–Meuse region. The most noticeable elements of difference are the relative abundance of scrapers and the strong representation of non-standardized tools (denticulated, notched, hammered, or scarred pieces, wedges) in the north part, and particularly in the Belgian territory, compared to the scarcity of hammerstones and the absence of expedient tools on big flakes in the Moselle area.

One explanation could be economic, because raw material sources are abundant in the Rhine–Meuse region and as a consequence the impact of the use and reuse cycle for the scrapers may have been less marked. Hammerstones in the northern assemblages are often made from old (blade) cores. In contrast, that kind of artefact is nearly lacking in the Moselle area. This can explain the absence of flint hammerstones in the latter area, which could be partially replaced by the hammered pieces on Taunus quartzite, a local raw material. Otherwise the Moselle toolkit is dominated by three main typological categories: scrapers, glossy pieces (partly sickle blades), and splintered pieces. Arrowheads are also quite well represented. Those particularities accentuate again the difference between the north part of the North-West LBK and the southern part, which seems closely related to the Neckar area.

A third relevant difference concerns arrowhead morphology and their left/right asymmetry. The Luxembourg series was introduced into a larger series collected from the literature or unpublished data (details in Hauzeur 2006, 295 f.; updated in Hauzeur and Löhr 2008). The resulting conclusions are illustrated by mapping the data (Fig. 12.4). The Moselle valley series fit quite well into a south-east–north-west progressive gradient, whereby symmetrical arrowheads decrease and right-lateralized asymmetrical

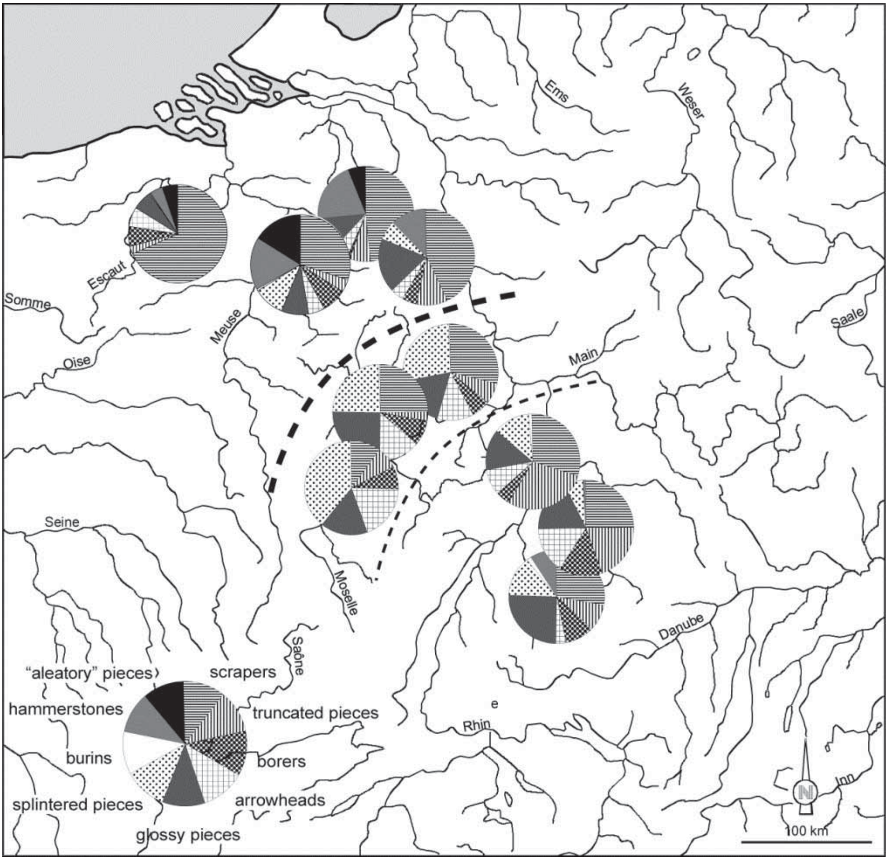


Fig. 12.3 North-West LBK flint tool assemblages, comparing the main typological categories. Data based on Hauzeur (2006) with additional information from Allard (2005), Constantin *et al*. (2010a; 2010b), and Hauzeur (2010).

pieces clearly increase. Despite economic factors such as a generally reduced size or a recycling process for some pieces, the tradition of left-lateralized asymmetry is maintained and a high proportion of symmetrical pieces is also present. If the Moselle area imported finished products from the Rhine–Meuse region—where the right-lateralized tradition is the most popular (Löhr 1994; Thévenin 1995)—this would mean that pieces were produced specifically for export, corresponding with the regional standard in the target area. Alternatively, the arrowheads would have been made somewhere in the Moselle area with imported blade roughouts. As yet, we have no evidence of tool making in Luxembourg and only reshaping processes can be observed—but some Belgian-Dutch flint cores and related unmodified flakes and blades are documented in the German Moselle area (Schmidgen-Hager 1993, 105–106). All these considerations suggest that the morphological features really express a cultural identity. This latter seems to be a tradition rooted in a Mesolithic context (as e.g. argued by Löhr 1994) and is part of a dynamic process of economic and ideological exchanges which have been underlined by several researchers for diverse fields of material culture (e.g. Jeunesse 2000).

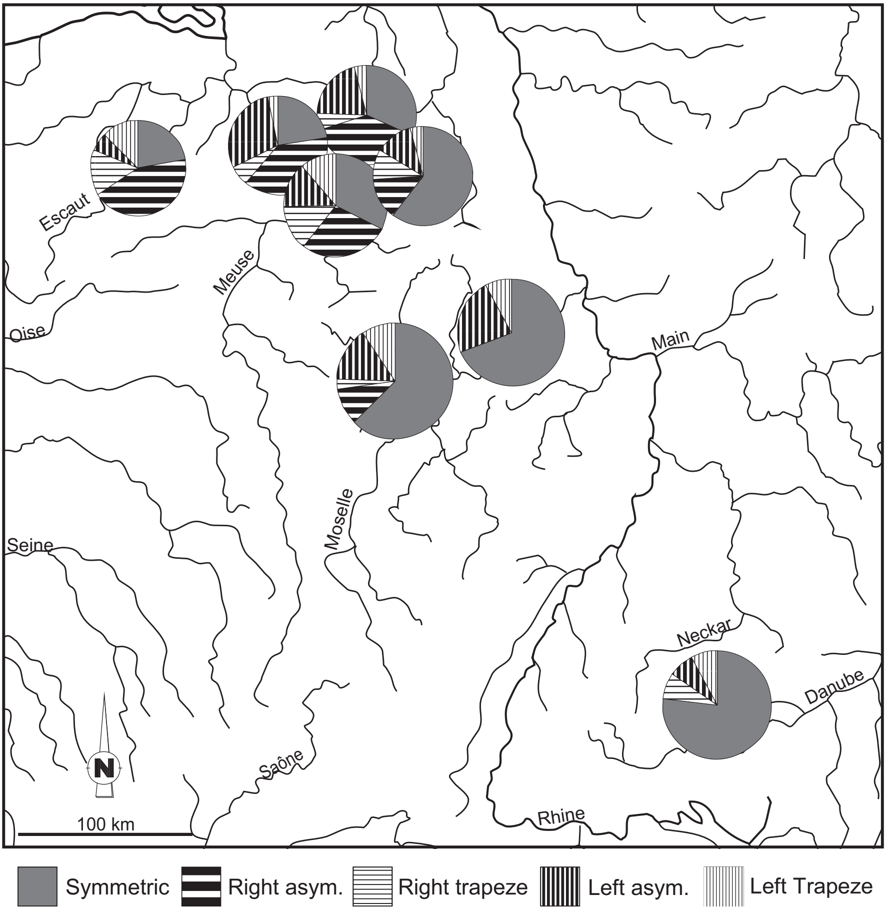


Fig. 12.4 North-West LBK arrowhead types. Details in Hauzeur (2006).

The Luxembourg ceramic corpus and its particularities

It is commonly accepted by researchers focusing on the western LBK that the Moselle valley belongs to the North-West stylistic province of the LBK (Fig. 12.1; summarized e.g. in Jeunesse 2001). It is also generally believed that regional characteristics are increasingly emphasized over the course of the LBK. The Luxembourg ceramic corpus fits with these two premises, but Walter Meier-Arendt and Émile Marx (1972) had already noticed that the corpus has stronger links with the south-eastern regions than with the northern ones. Selected examples of the best-preserved pots from LBK phase IId in Luxembourg show the richness of the decorative motifs (Fig. 12.5, as well as some particularities. No doubt this corpus is linked with contemporaneous assemblages from the Lower Moselle and the Rhine–Main area. They are characterized by hatched motifs, herringbone patterns, "empty" bands, and so-called "*Nebenbänder"* (secondary bands). The combination of herringbone patterns, narrow empty bands, and *Nebenbänder* made with a multi-toothed comb is typical of the Moselle–Rhine confluence (forming the so-called Plaidt style). In contrast, only few vessels or single pots in these assemblages can be related to the Rhine–Meuse area, showing large bands filled with impressions (made with single- or multi-toothed combs), or rhombic patterns covering the entire surface (the "Cologne style"; e.g. Meier-Arendt 1972). It seems that the two main areas of the North-West LBK province kept their stylistic specificities during the Latest LBK, when contacts must have been established with the Belgian and Dutch flint-producing areas. One explanation could be that the Luxembourg settlements did not directly and personally exchange flint products, and were just consumer sites. As they would obtain their flint products indirectly, they would be less exposed to northern influences, keeping a Moselle–Rhine style.

In detail, other decoration patterns clearly show the intermediate position of this region between two LBK worlds. The cross-hatched pattern ("*Kreuzschraffur*") is considered typical for the Middle Rhine. With the exception of the settlement at Alzingen, the cross-hatched patterns make up an average of around 5 % of the band decorations, while their relative frequency in the Rhine–Meuse area is much lower (≤1 %). The absolute importance of this pattern at the Rhine–Main confluence makes the decreasing gradient from south-east to north-west noticeable (Hauzeur 2006, fig. 269). A few pots show decoration similar to the Palatinate LBK (Jeunesse *et al*. 2009), whose core zone is located in the Rhine–Neckar area (formerly "Oberrhein–Pfalz style"; Lindig 2002). They illustrate that the possible sphere of influence of this regional group could

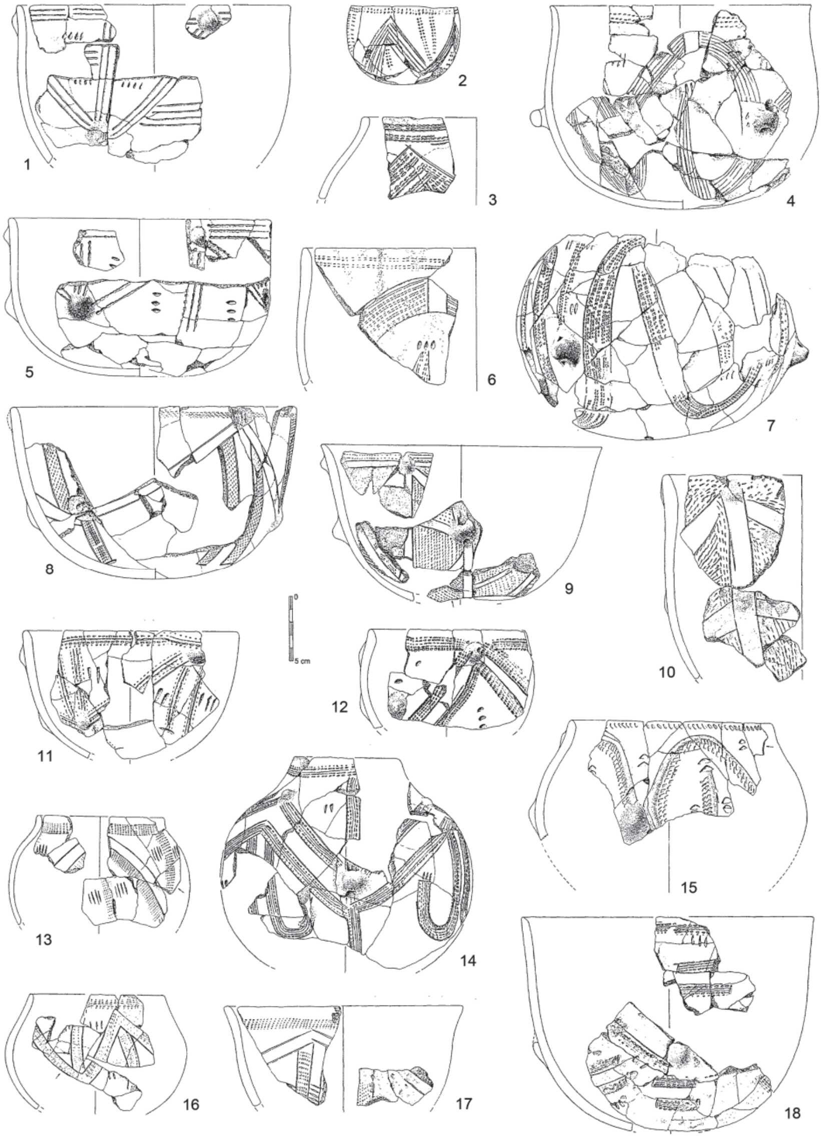
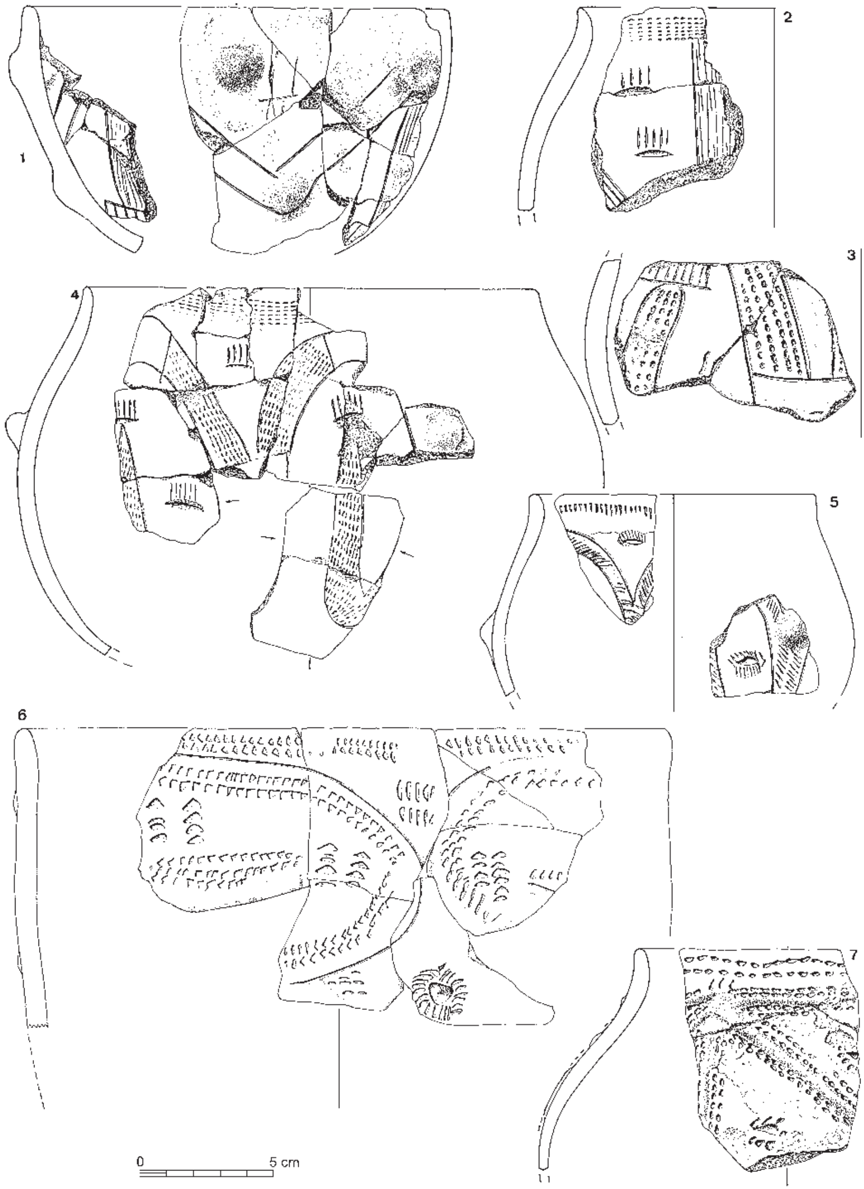


Fig. 12.5 Selected ceramics from Luxembourg LBK IId. 1, 2, 5, 9, 13, 16 Remerschen; 3, 4, 6, 7, 10, 15, 18 Alzingen; 8, 11, 12, 14, 17 Altwies (Hauzeur 2006).

extend to the Moselle basin (e.g. the site of Remerschen, Fig. 12.5, 1–2), where these vessels are locally made. In this case, the question is how to define the type of interaction that brought this pattern about. One of the most evident examples of interaction is probably the presence of adzes made from rocks of the amphibolite family in Luxembourg, which could have induced contacts or exchange of raw materials or finished products. The south-eastern origin of the amphibolite adzes (e.g. analyses by Michel Errera published in Hauzeur 2006, 418–419) could have opened up a stylistic "road" introducing the Palatinate style and maintaining relations with the Middle Rhine area (Neckar, Main, Eifel). The practicalities of exchange remain difficult to evaluate as only material artefacts have been preserved, while people and ideas also circulate in networks.

The intermediate position of the Moselle area can also be documented by particular secondary decoration motifs. The rake-like motif is a combination of a series of long vertical impressions sitting on top of a horizontal short line. It is one of the characteristic motifs of the Middle Rhine, and is mainly found along the Lower Neckar and in the Kraichgau, as far as the Danube (e.g. in Bavaria; Brink-Kloke 1992, pl. 12, 95, 138). It can be found on a few pots in the Luxembourg territory: two at Remerschen, one at Altwies, and at the beginning of the most recent LBK phase at Weiler-la-Tour. It does not exist in the Rhine–Meuse area (Figs 12.6, 12.7). The sun-like motif is composed of a cup-like impression surrounded by smaller dots and is generally used as secondary motif. Its distribution is complementary to the rake-like motif. The core is located in the northern part of the North-West stylistic province up to the Moselle basin. One example each was found at Altwies and Weiler-la-Tour, two at Remerschen, and three at Alzingen (Figs 12.6, 12.7). Comparing the two geographical distributions, the Moselle valley appears to act as a border cutting the Rhine basin LBK into two parts, a northern and a southern one. It is tantalising to interpret these mutually exclusive distributions as simply spheres of influence of a network, but with a greater role of cultural roots in the south and a greater impact of economic constraints in the north. This is purely conjectural, but we can count on future data to check and refine all these observations.

Fig. 12.6 (right) Examples of pottery showing the rake-like and sun-like motifs. 1 Altwies; 2, 4 Remerschen; 3 Weiler-la-Tour; 5, 6, 7 Alzingen (Hauzeur 2006, pl. 279).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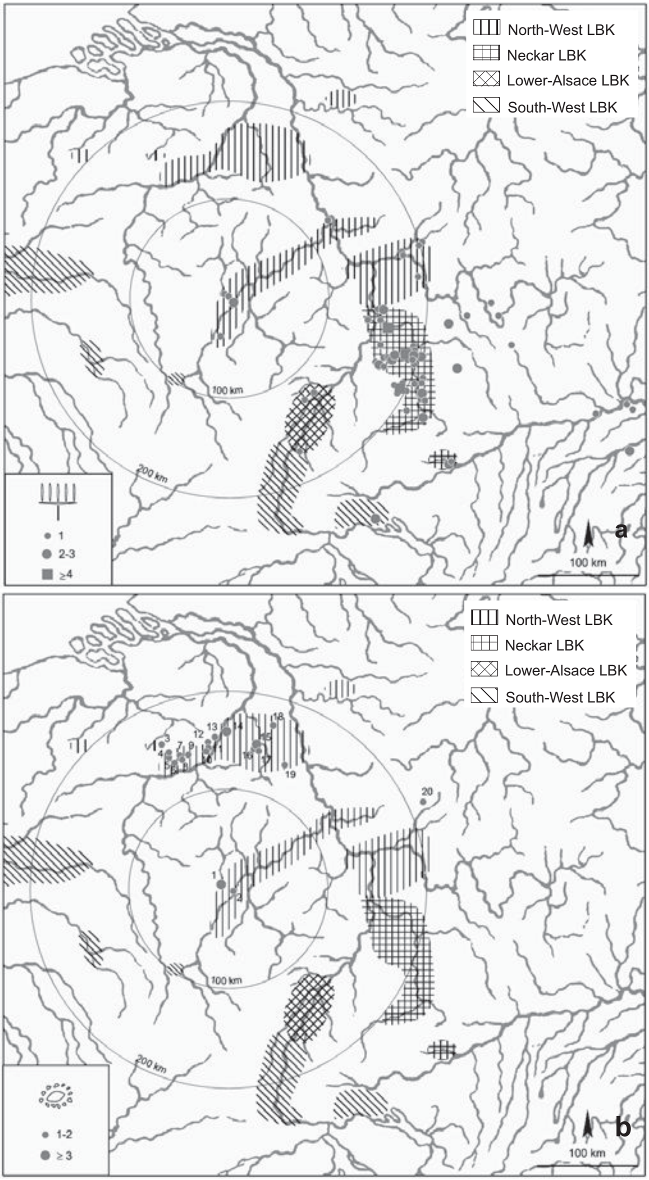

Fig. 12.7 In between two worlds: distribution of the rake-like (a) and the sun-like (b) patterns.

Conclusion

By mapping different aspects of the material culture against each other, the intermediate position of the Middle Moselle LBK becomes evident. The example of the Luxembourg settlements illustrates the dynamic network between the north and the south part of the North-West LBK. Different kinds of interaction can be observed. On a first level, the flint network is clearly a necessity induced by the lack of good siliceous materials in the Moselle valley and seems mostly based on economic needs. It is oriented towards the north from the Moselle point of view, i.e. it lies within the North-West LBK. At the end of the period, this “northern” connection is joined by others. New relations are established with western sources located in the central part of the Paris Basin, perhaps controlled by neighbouring cultures like the Villeneuve-Saint-Germain and the “Rubané Récent du Bassin Parisien”. The impact is clearly visible throughout the material culture repertoire, for instance in new pottery decorations in some Lorraine assemblages and an increase in Tertiary flint artefacts in the same settlements.

However, a second level of exchange concerns the maintenance of a tradition or a cultural link towards the south-east, which is visible in the shape of the arrowheads. This suggests a quite clear dichotomy between economic impact (raw material procurement from the Belgian–Dutch province) and identity recognition (tradition of left asymmetry). This second level of interaction goes beyond simple functional considerations. The ceramic style or decorative patterns found in the Late LBK settlements in Luxembourg are obviously linked geographically with the Rhine–Main area, but also have clearer similarities with material from further to the south, in the Neckar area, rather than with the northern provinces inside their own stylistic group, i.e. the North-West LBK.

This shows the kind of interactions between the neighbouring areas, as well as the degree of cultural permeability. If the explanation for a privileged relation towards the south could be found in the weight of tradition, the orientation towards the north belongs more obviously to the economic sphere. This conclusion remains based on the knowledge of preserved LBK material culture: house plans, shape of arrowheads, origin of raw materials, and general and specific patterns in ceramic decoration. We are mostly ignorant of the non-material, social, and ideological behaviour related to the circulation of goods and ideas.

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Notes

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[1] This importantly depended on specific human and scientific variables at the time of discovery, excavation, or initial analyses. Data was extracted from publications and complemented with additions based on the author’s further research. Because of these different sources for establishing comparisons, the detail available for the different aspects varies. Recent publications for the north part of the North-West stylistic province have been added and will be mentioned depending on the case study.

CHAPTER THIRTEEN

THIS LAND IS YOUR LAND, THIS LAND IS MY LAND: A DUTCH VIEW ON LBK SETTLEMENT PATTERNING

IVO VAN WIJK

Introduction

A part of LBK research has always focused on settlement patterning and dynamics in central Europe (Bakels 1978; Ebersbach and Schade 2004; Linke 1976; Zimmermann 2010). The old notion of colonization and migration has been nuanced over time in favour of a newer paradigm that emphasizes acculturation, adaptation, and the involvement of local Mesolithic groups (such as La Hoguette) in relations with the LBK farmers (Gronenborn 1990; 2007; 2010; Jeunesse *et al.* 2009; Zvelebil *et al.* 2010). A new type of evidence available from aDNA and stable isotopes is still debated (Bickle and Whittle 2013; Lüning 2014). The concept of migrating farmers is still valid, but the scale at which this migration took place is now thought to be reduced, and the process is presently seen as a merging of acculturation and assimilation (Gronenborn 2007; Jeunesse *et al.* 2009; Zimmermann 2010; Zvelebil *et al.* 2010). To check this concept against data from the Netherlands it is therefore necessary to identify these different processes in the archaeological record, especially since aDNA research is not applicable here due to poor bone preservation.

The first model of Neolithization in Europe mentioned above has been dubbed the "wave of advance" model (Ammermann and Cavalli-Sforza 1973; 1979; Buttler 1938; Clark 1965; Van de Velde 2008). At best, this model is useful for a very general explanation of the spread of the LBK, but it offers little or no insight into the interaction between farmers and hunter-gatherers, as this will have taken place at an interpersonal level

(Amkreutz *et al.* 2009; Van Wijk *et al.* 2014). In the Netherlands this Neolithic immigration is part of a larger discussion (Amkreutz *et al.* 2009; Van de Velde 2008; Vanmontfort 2008; Vanmontfort *et al.* 2010), which also concerns the visibility of Mesolithic–Neolithic interactions and of Mesolithic sites especially in the Graetheide research area.

Ethnographic accounts and historical sources documenting processes of colonization point out that colonization was a deliberate and carefully planned undertaking on the part of those moving, the understanding of which helps to explain the evidence available in the archaeological record (Burmeister 1996; Graves and Addison 1995; Gronenborn 2003; Housley *et al*. 1997; Mandrini 2004; Melo Bento 1986; Van de Velde 2008). To summarize, the process of colonization goes through three distinct phases: the discovery, exploration, and finally exploitation of the region to be colonized. Each of these is a necessary element for the next. The question is therefore whether these processes are visible within the LBK settlement system, that is in the structure of the physical and cultural landscape. It is of importance to understand and in a way reconstruct the Neolithic physical landscape, because some key features of this landscape are nowadays invisible due to erosion processes. The same more or less applies to the way in which the cultural landscape, which amongst others consists of settlements and cemeteries, was formed; most of its aspects remain unknown to us, as excavations have mostly been carried out at large find spots, without covering the full diversity of the past situation.

In a recent study, settlement data have been acquired for several excavated or surveyed yet unpublished Dutch Bandkeramik settlements on both sides of the Meuse river (Graetheide and Caberg regions) (Van Wijk *et al.* 2014). It thus became possible to contextualize these data with previously published, well-known sites and finds, offering a better idea of the diversity of LBK settlement characteristics in southern Limburg (Modderman 1988).

The present paper specifically deals with characteristics of the Holocene Atlantic landscape in the Graetheide and Caberg regions at the time of the LBK occupation and the way the LBK settlement system adapted or forced itself onto this landscape. Site locations are studied focusing on potential differences in site use and patterning within the natural landscape. One of the main questions is why these first farmers chose particular locations outside their primary home range (Bakels 1982), and what factors contributed to that choice (Modderman 1988, 80). The simultaneous use of the region by both hunter-gatherers as well as farmers makes it a contested landscape (Bender 1993), because different and potentially conflicting concepts of landscapes overlap. Migration and settlement processes therefore have to be viewed within the frames of at least the physical and cultural landscape, which can vary for each region. A landscape-oriented approach is not particularly new. Already in 1978 Corrie Bakels published an overview of the then known Dutch LBK sites within their natural setting.[1] At the time her research was quite limited (as she noted), although she discussed many aspects of the physical landscape (Bakels 1978, 132; see also Lüning 2000, 200). Later investigations have added new data, but restrictions remain. As for hunter-gatherers, many aspects of LBK daily life are very hard to reconstruct.

Terrace landscape

The landscape of southern Limburg has mainly been shaped by the activities of the Meuse river in the Quaternary period (Van Wijk *et al.* 2014). The region was tectonically lifted and slightly tilted on a north-east–south-west axis, which shifted the location of the Meuse river valley westward to its current position. The cyclic alternation of gravel deposition during the colder glacial periods, and the incisions by the Meuse river and its tributaries during the warmer interglacials, created a stepped pattern of river terraces (Fig. 13.1).

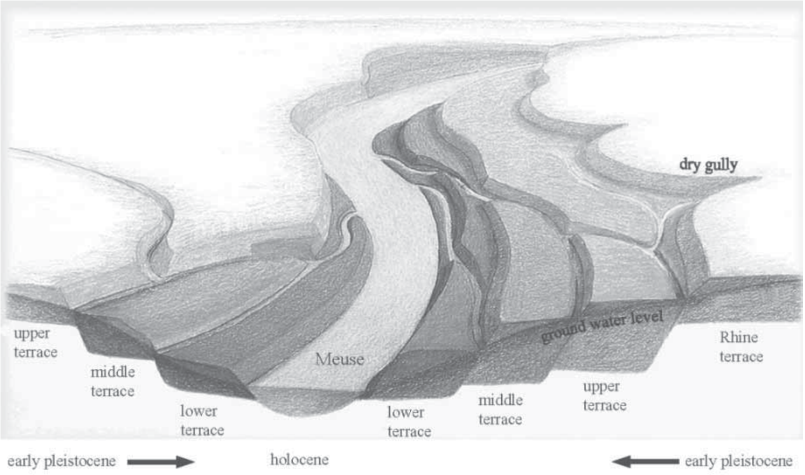


Fig. 13.1 Schematic overview of the different Meuse river terrace floors (© E. Meijs).

As a result the oldest (Early Pleistocene) and highest terraces are in the eastern part of south Limburg and the youngest in the vicinity of the modern river bed in the west. From east to west the upper, middle, and lower terraces are distinguished (Fig. 13.2). A number of smaller tributary systems of the Meuse river, such as the Geleenbeek, Geul, and Jeker, have cross-cut these terraces. During the last two glacials (Saalian and Weichselian) the Meuse river terraces eventually became covered with windblown loess deposits, thus partially obscuring the step-like relief of the area.

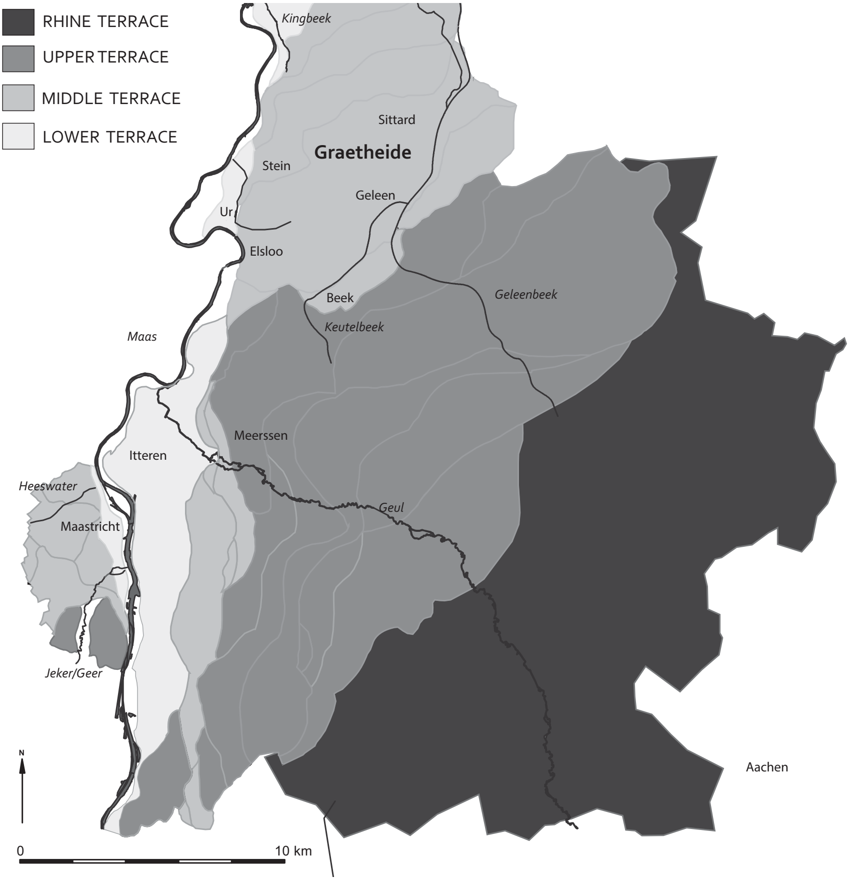


Fig. 13.2 Reconstruction of the terrace landscape in the southern Netherlands.

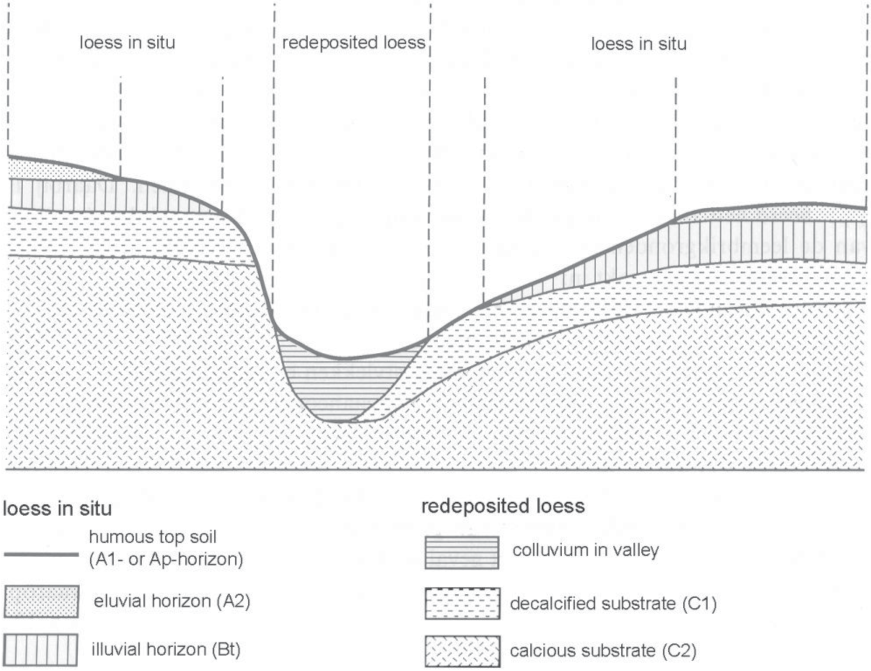


Fig. 13.3 Schematic cross-section of a dry valley (© Stiboka 1990).

Quite conspicuous are the wide valleys created by small streams such as the Geul, Geleenbeek, Jeker, and Ur that cut into the different terraces. Less visible are the dry valleys which were formed and shaped by meltwater during the Pleistocene. Due to the uneven warming of the valley slopes and the resulting uneven erosion, the valleys developed asymmetrical cross-sections (Fig. 13.3). The "sunny sides" became more eroded and therefore more flattened than the colder and steeper "shadow sides". Currently these dry valleys are hardly visible in the landscape, since they have largely been filled in with colluvium in the Holocene, or have recently been built over. Research in these dry valleys demonstrated that they were originally several metres deep (Van Wijk 2012; Van Wijk and Van Hoof 2005). It is possible that during the Atlantic climate phase, these dry valleys did not continuously, but only periodically carry water from surface run-off or from subsoil water in the valley slopes. With respect to archaeology, and taking into account the warmer as well as wetter conditions of the Early Atlantic period, it is likely that water was running through these (then not so) dry valleys in the Neolithic (Modderman 1970). Due to twentieth century agriculture and open-cast mining, the groundwater level has been lowered, resulting in the (periodic) drying out of wells and dry valleys.

On good grounds

At the time the first farmers entered and settled on the Limburg loess plateaus, these were covered with lime and oak trees in a mixed deciduous forest with little undergrowth (Bakels 1982; 2009). Previously a dense forest was assumed, but currently it is accepted that open areas existed in the woods (Kreuz 2008). Many of the raw materials required by the LBK settlers were available within their home range (Bakels 1978; 1982). Stones could be picked up from the bed of the Meuse river, and flint could be found in the Meuse river terrace deposits or in eluvial contexts. Timber, plants, loam, and game were available in copious quantities. Streams and natural springs provided an adequate supply of fresh water. In short, excellent settlement conditions existed. However, the region was also inhabited by Mesolithic hunter-gatherers, with evidence found mainly on the edges of the loess plateaus or on spurs, especially along the Geul valley (De Grooth 2007 *versus* Vanmontfort 2008; Verhart 2000); a contested landscape can therefore be assumed (Bender 1993; Frirdich 2005). Typical LBK finds outside the LBK settlement area sometimes occur in loose association with non-Bandkeramik artefacts (e.g. Brounen 2014; Vanmontfort *et al.* 2010), suggesting that LBK farmers were aware of these indigenous occupants and were probably in contact with them, perhaps during exploratory and/or hunting expeditions or when herding their cattle within and beyond the loess area (Van de Velde 2008; Vanmontfort 2008).

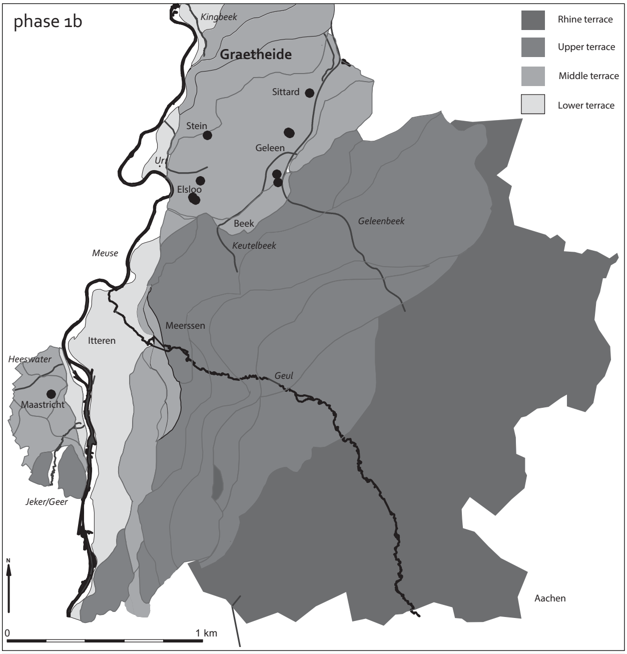
These conditions beg the question on what choices the founding of the first Bandkeramik settlements was based, especially since there seems to be a changing pattern in settlement location choices in the later LBK occupation of the area. Within the southern Dutch terrace landscape it is striking that LBK settlements are only found within a restricted region of 15 by 20 km. It is notable that looking at the physical landscape where the first settlements were founded and which probably was for the most part a *terra incognita* for the first farmers—apart from some small scale explorations—these settlements all cluster within a relatively small area. Although it appears that all of southern Limburg was potentially available for settlement, archaeological excavations indicate that during the Flomborn (or Early LBK) occupation phase (before 5200 cal

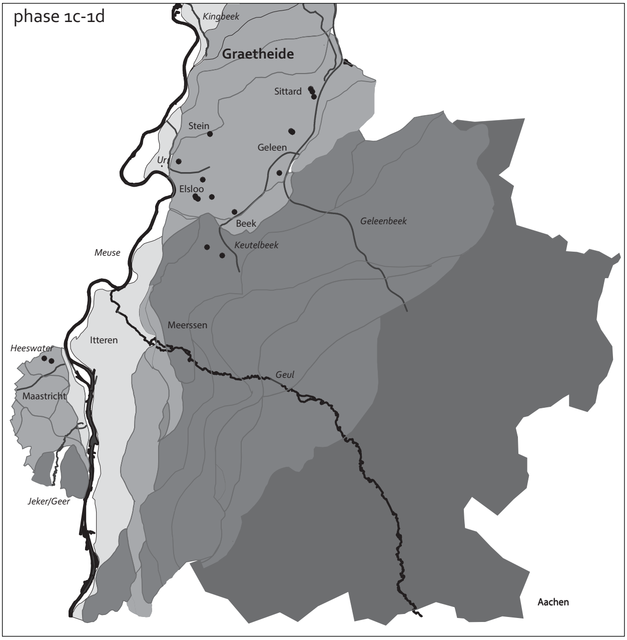
BC/Modderman phase 1b; Meier-Arendt 1966), only certain areas were preferred for initial settlement (Fig. 13.4): parts of the middle terrace (the Graetheide plateau between Sittard and Stein) and the middle terrace west of the Meuse river (the Caberg region near Maastricht). From an environmental perspective, it can be stated that the location choice for these first settlements was practical and without a doubt deliberate (Van Wijk *et al.* 2014). All known pioneer settlements[2] on both the Graetheide and the Caberg seem to share the same site characteristics (Bakels 1982; Lüning 1982; Modderman 1988, 88). They are:

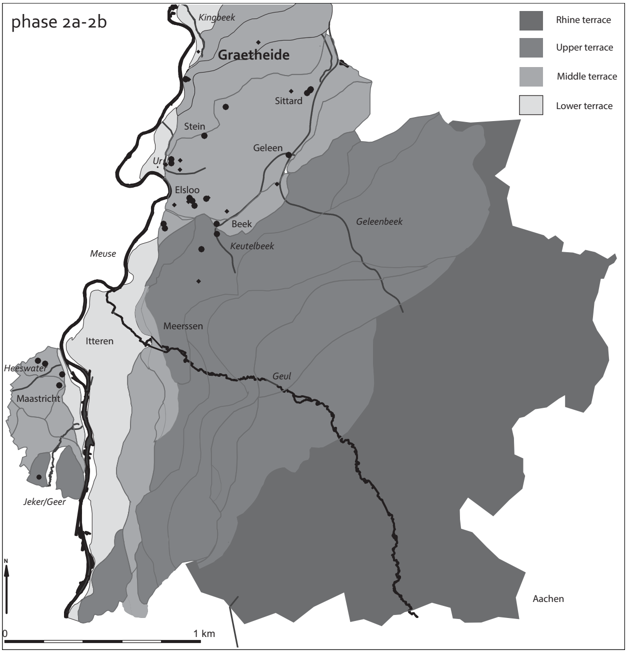
- On the edge of a loess plateau, in this case the middle terrace. From this location several ecological zones are within short reach, allowing optimal possibilities for exploitation of the surrounding natural landscape.
- Less than 750 m from permanently running fresh water, in this case the Geleenbeek, Ur, and Heeswater.
- Located on a more or less flat part of the terrain with a southern orientation, ranging from south-east to south-west (Linke 1976; Modderman 1988, 84).[3]

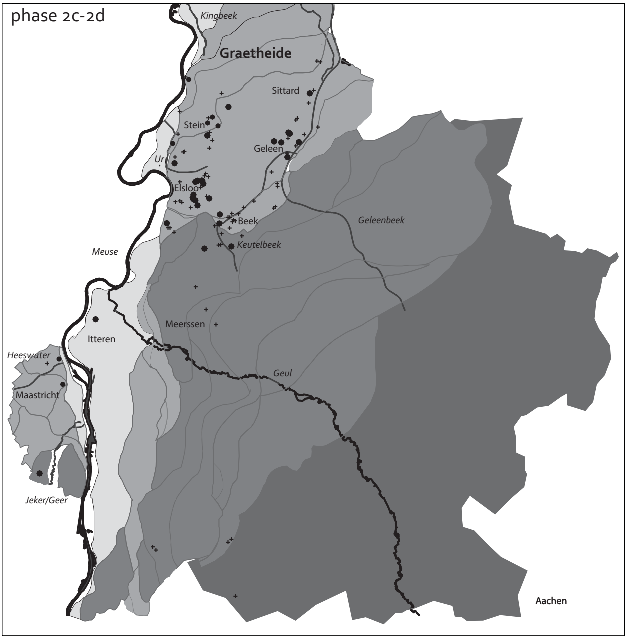
The preference of a specific location appears to have been uniform for all (Dutch) Flomborn phase settlements, suggesting that preferred characteristics in site location choice existed. In the process of (pre)colonization (often by younger members of a group) the reconnaissance of new settlement areas is part of the phase of discovery (Frirdich 2005; Van de Velde 2008) during which accidentally or intentionally discovered areas are “examined” for various material and immaterial characteristics, such as landscape qualities, agricultural potential, distance to eldest brother, permission of ancestors etc. Most of these conditions are of course beyond the reach of archaeological discovery. When certain areas qualified, a subsequent phase involved a prolonged period of testing, during which the potential of the surrounding area was studied and recorded (Burmeister 1996; Frirdich 2005; Gronenborn 2003; Housely *et al.* 1997; Van de Velde 2008; Zimmermann 2010). This was probably done by a small group of pioneers in a temporary encampment in a clearing in the forest and might have included the sowing of an agricultural field and monitoring its productivity. At the same time, the relations with the original inhabitants of the area will also have been subject to scrutiny and included in the equation.

Fig. 13.4 (next pages) LBK habitation during Modderman phases 1b–2d. Undated settlements are marked with a +.


phase 1b
Rhine terrace
Upper terrace
Middle terrace
Lower terrace
Kingbeek
Graetheide
Sittard
Stein
Geleen
Urt
Elsloo
Beek
Geleenbeek
Keutelbeek
Meuse
Meerssen
Itteren
Heeswater
Maastricht
Geul
Jeker/Geer
Aachen
N
0
1 km


phase 1c-1d
Kingbeek
Graetheide
Sittard
Stein
Geleen
Urt
Elsloo
Beek
Keutelbeek
Geleenbeek
Meuse
Meerssen
Itteren
Heeswater
Maastricht
Geul
Jeker/Geer
Aachen


phase 2a-2b
Kingbeek
Graetheide
Sittard
Stein
Geleen
Ur
Elsloo
Beek
Keutelbeek
Geleenbeek
Meuse
Meerssen
Itteren
Heeswater
Maastricht
Geul
Jeker/Geer
Aachen
N
0
1 km
Rhine terrace
Upper terrace
Middle terrace
Lower terrace


phase 2c-2d
Kingbeek
Graetheide
Sittard
Stein
Geleen
Ur
Elsloo
Beek
Keutelbeek
Geleenbeek
Meuse
Meerssen
Itteren
Heeswater
Maastricht
Geul
Jeker/Geer
Aachen

The choice of similar settings seems to support a systematic approach to settlement siting, but it has to be stressed that within the Graetheide most areas seem to be suitable, with the exception of its central part, where open water and dry valleys are scarce. Why, then, did areas between settlement clusters like the Graetheide, Rhineland, and Caberg remain uninhabited, although isolated finds show that these areas were at least travelled through (Frirdich 2005; Modderman 1988; Van Wijk *et al.* 2014)? From a purely geo-physical point of view, there is no reason why these areas could not have been settled, as all of the three mentioned characteristics are present. Therefore, a socially divided cultural landscape must have existed, which prevented settlement (Bakels 1978, 130; 1982, 3; Bogucki 1988, 123; Frirdich 2005, 101; Van Wijk *et al.* 2014). The absence of settlements in the direct vicinity of important flint outcrops near Banholt and Rijckholt could be seen as an example of places where colonists were forbidden or socially restricted from settling. The importance of Banholt and Rijckholt flint as a special commodity for the production of cores and blades is shown by their wide geographical distribution, but also by the—social—need to search for alternative flint sources, sometimes even Rijckholt lookalikes, when settling at greater distances from the Banholt and Rijckholt outcrops (De Grooth, this volume). Even when in the Late LBK diversification of raw material preferences occurred at a number of Dutch sites (De Grooth, this volume), the vicinity of the outcrops remained uninhabited.

It is of importance to note that both the areas left and right of the Meuse river were occupied simultaneously. One could assume that upon arrival in these parts the LBK farmers (originating from the middle Rhine area) proceeded along the Geul and Meuse rivers in their quest for new land. The particular choice of both the Caberg and Graetheide areas does not seem very obvious when older known and used routes and communication lines in the landscape are included in the analysis. Modderman already indicated that the better routes for exchanging products, for keeping up social relations, and for the exchange of knowledge would most likely be situated in the easily accessible Atlantic forest instead of traversing the wetter areas in the valleys (Modderman 1988, 127), but the latter form excellent guides within the natural landscape. Despite—or because of—this, the earliest settlements are situated along the stream valleys. It could be argued that if not transport routes, the valleys may at least have been easily recognizable geographical features in the densely forested area. The Mesolithic inhabitants probably used the rivers and stream valleys intensively. Their knowledge of the terrain may also have been of use to the earliest LBK farmers. It seems clear that (open) areas in the middle of the Atlantic forest and further away from running water were avoided or uninhabited by both Bandkeramik settlers and Mesolithic groups alike.

The Bandkeramik exploration of the Dutch loess area in search of "good grounds" to locate pioneer settlements thus seems to be based on a set of geographical factors. It should be emphasized, however, that they are only part of a larger spectrum of considerations that are intrinsic to location choice.

A Bandkeramik occupation history

In the next phases of occupation (Modderman phases LBK 1c–1d)[4] an expansion is perceptible around the initial pioneer settlements on the Graetheide plateau along the Ur and Geleenbeek, even to the upper terrace. On the Caberg, occupation may have expanded further west along the Heeswater, although precise data are lacking in this area.

The number of settlements kept increasing, again mainly in the vicinity of the original pioneer sites such as Elsloo and Sittard, although some settlements were founded at greater distances, both in a northern direction (Urmond) as well as further south (Beek, Kelmond, Geverik). Increasingly, parts of the upper terrace were settled. Also, the central area of the Graetheide plateau was occupied, as demonstrated by sites such as Geleen–Urmonderbaan and Geleen–Grasbroek close to the northern limit of the loess, and at rather large distances from open water (2 km). Expansion even reached beyond the loess, into the floodplains of the Meuse river near Stein and Itteren (lower terrace), where areas were tested and settled (Amkreutz 2006; Brounen and Rensink 2006).

In the penultimate phase of the Dutch LBK (phase 2b), a peak was reached in the number of contemporary settlements on the Graetheide, which ultimately may have led to socio-economic stress and (more) migration towards new grounds in, for example, Belgium, where most settlements date to the Younger LBK. Especially the area around Beek saw a marked increase in settlements towards the edge of the Geul valley during phases 2b and 2c. On the other bank of the Meuse river near Maastricht, an expansion is apparent from the Caberg southward to the Cannerberg and probably also further along the valley of the Jeker/Geer into Belgium (again, precise data are lacking). Here, too, an increase in occupation density is witnessed during the last phases of the LBK. Towards the end of the LBK (phase 2d) most settlements were probably still inhabited in spite of the decline in numbers of settlements and houses, still suggesting a dense population on the Graetheide. Gradually that occupation came to an end; however, how and why the LBK eventually left the area is still very much a mystery (see Amkreutz, this volume).

Settlement dynamics

Although not all known sites have been dated and settlement duration can sometimes only be estimated, or not, due to limited excavation areas, it is evident that settlement density was high; approximately one house or settlement per square kilometre. Figure 13.5 shows that the first expansion of new hamlets was restricted to the immediate surroundings of pioneer settlements, just like the first settlements near Königshoven (Claßen 2012). Later in time, new grounds and environments on the upper, middle, and lower terrace were tested and settled. Known water-carrying streams like the Geleenbeek, Ur, Watervalderbeek, and Keutelbeek seem to have played an important role. Comparable expansion has been assumed for settlements along the Merzbachtal in the Rhineland (Lüning 1982). Although settlement dynamics seem to be uniform and traditional, it is clear that various locations were inhabited. A detailed view (Fig. 13.5) shows that quite different locations, such as the upper terrace with more difficult access to running water, but also the Meuse valley (lower terrace, with grounds subject to seasonal flooding), were inhabited. The question arises which socially or culturally motivated processes caused this change in behaviour. It is therefore necessary to zoom in at the different site locations in order to understand the difference in the choices which were made, although there are reservations that such an approach could become too ecologically deterministic.

At a closer look (Fig. 13.5) the diversity of the physical landscape becomes visible: dry and stream valleys cut through the loess-covered Meuse river terraces; each terrace is differentiated from the other by terrace edges and erosion ridges. Especially the eastern part of the region seems to be too "cut up" to be suitable for habitation, which could offer a possible geographical explanation for the uninhabited area between the Graetheide and Rhineland clusters; however, the environmental resources of the area could easily have sustained settlement.

Regardless of their geographical positions on lower, middle, or upper terraces, the location of most of the settlements in the immediate vicinity of a dry valley or stream is evident. Although it remains uncertain whether dry valleys carried water all year round (Bakels 1978; Modderman 1988), the relation between settlements and dry valleys might not only be related o the water source. Nowadays dry valleys are hardly

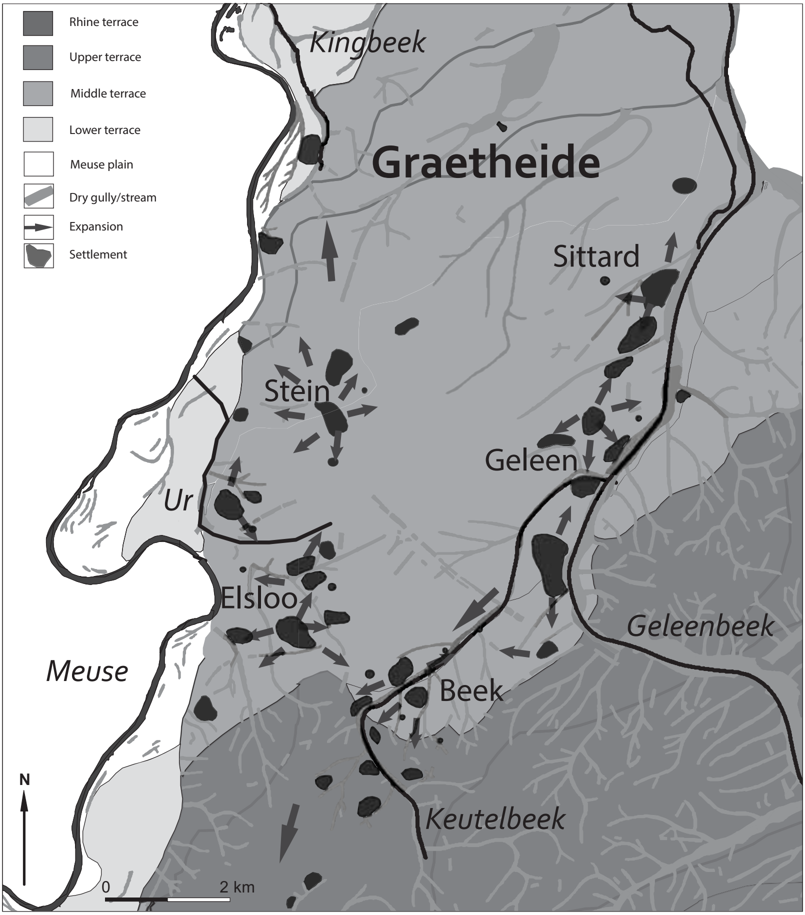


Fig. 13.5 Settlement dynamics in the Graetheide area. Estimated maximum extent of the settlements is shown in grey (without assumed area for cultivated land).

visible in the post-medieval cultural landscape, but during the Early Neolithic they attained depths of a few metres and were over 20 m wide. Water was only periodically present when precipitation was high. Water accumulated in the (then not) dry valleys at the terrace edges (Van Wijk 2012; Van Zijverden 2006). Dry valleys were readily visible due to being cut into the subsoil, but also because of different vegetation.

Looking past the need for running water and therefore the imperative for farmers to live near dry or stream valleys allows us to investigate the location choices of Bandkeramik people and their relationship with their physical and cultural landscape from another viewpoint. The Caberg is used as an example.

The case of the Caberg

The Caberg is situated north of the city of Maastricht on a middle terrace close to the Meuse river. The slightly hilly area is intersected by the Heeswater valley and the Zouw valley. The eastern border is the terrace edge which constitutes the transition to the lower terrace, i.e. the Meuse valley floor; a height difference of about 20 m. Although the Heeswater undoubtedly carried water perennially, the Zouw was probably only semi-periodical.[5] Excavations in the area pinpointed the location of at least six different settlements (Van Wijk and Meurkens 2008), presumably belonging to the same settlement cluster (Van Wijk *et al.* 2014). All settlements are located on the northern, sunny slopes along the Zouw and the Heeswater (Fig. 13.6).

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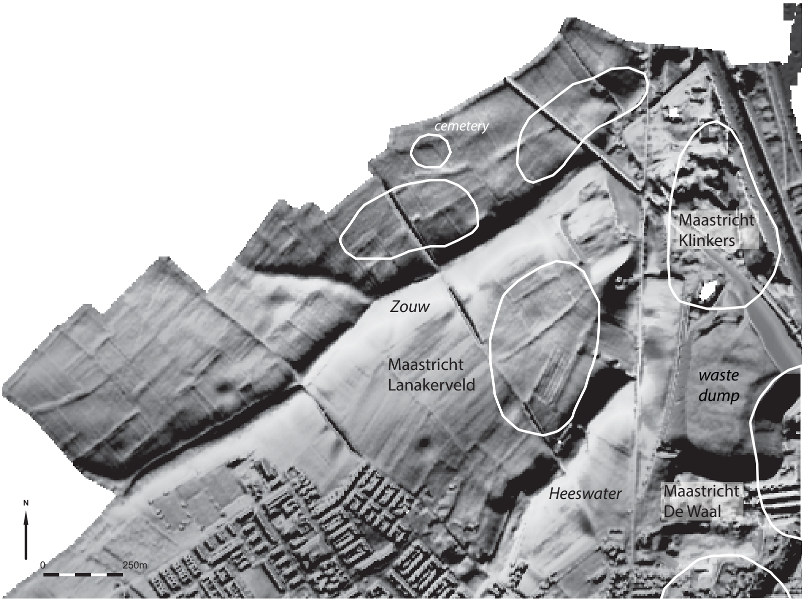

Fig. 13.6 LIDAR image of the physical landscape around Caberg and the LBK settlements.

There are no traces of settlement features on the higher parts to the north-west. However, it is here that a cemetery is situated. Most of the settlements existed simultaneously (in a range of Modderman phases 1b–2d), with two habitation peaks in phases 1c–1d and 2b–2c. The cemetery is provisionally dated to phase 2a–2b (Van Wijk and Meurkens 2008). The excavated sites on and around the Caberg are possibly part of a larger group of LBK settlements along the Heeswater. With its sources further west in Belgium, this stream runs along the northern slope of the Caberg and originally drained into the Meuse river. The settlements along it were originally grouped as the Heeswater cluster (Bakels 1982; 1987). The many settlements along the Geer/Jeker in the Belgian Haspengouw may also belong to this same settlement cluster.

Although at first glance the Caberg settlements seem to form one geographical cluster, they are actually separated by the two valleys of the Heeswater and Zouw. The settlement of Maastricht–Klinkers, which is located at the junction of both valleys and the Meuse river, seems to have been situated on the most pronounced spot in the area. The position of this settlement and the surrounding ones within the physical landscape is remarkable, to say the least. Could this be a coincidence or is the positioning of the various settlements and the cemetery deliberate? And what role did the Heeswater and Zouw streams play? The relationship between settlements and dry valleys or streams is suggestive, not only around the Caberg but for most settlements on the Dutch loess. It looks as if settling in the vicinity of a dry valley or stream was more important than the availability of certain raw materials. For instance, flint at the Caberg sites has not only been mined at known outcrops at some distance, such as Rijckholt or Banholt, but a substantial part has also been gathered from gravel beds of the Meuse river, while other flint types were obtained through exchange via Belgium (De Grooth 2014). Although of lesser quality than the Lanaye (Rijckholt/Banholt) flint, the outcrops of which are less than half a day’s march away, an inferior flint was used, which shows that raw material was by no means the decisive factor in the location choice of this settlement. As stated above, there are not even any known settlements in the direct vicinity of the flint outcrops. The basic need for water could hence be regarded as the most obvious incentive for (this) settlement, yet other motives, either social or economic, have to be considered as well.

Chosen grounds

If one thing is clear about the Bandkeramik culture and its widespread appearance, it is that there was neither an economic need nor population pressure to explain the vast *landnam* (Bogucki 1988; Frirdich 2005; Zimmermann 2010). As Frirdich (2005) argues, the *landnam* was a defining characteristic of the LBK. Space between settlements, at least between the oldest sites, was a legacy of the hunter-gatherers' social system where space between the different groups was "needed" as a sort of social or economic risk management or for prestige. Establishing a new settlement in unknown territories, away from the "mother" settlement, did not only reduce economic pressure there but also showed the economic competence of the colonisers and their success in creating independence. In this way, the *landnam* is regarded as a prestigious act (Frirdich 2005). This may explain the social incentive for the *landnam*, but does not offer an explanation for the location choice.

In densely inhabited regions like the Graetheide or Caberg (Fig. 13.7), with approximately one settlement or household per square kilometre, the distance between settlements became shorter over time (Fig. 13.5). As the *landnam* progressed, the availability of new grounds diminished steadily, but the need for "social distance" remained. Therefore we first have to think of how much space is needed between settlements and how this space is assessed. The natural division of the landscape into valleys and ridges offers natural borders which are often regarded as social ones, too: even in modern times a country's borders are mostly positioned at rivers or mountains which stand out in the natural landscape. On the Dutch loess soils natural borders are represented by the Meuse river and smaller streams like the Geleenbeek, Watervalderbeek, Ur, Kingbeek, Keutelbeek, Geul, Kanjelbeek, Heeswater, and Limbrichterbeek. They are the first physical borders along which pioneer settlements have been established (Fig. 13.4). By no means did they constitute a physical barrier, as is shown by the simultaneous occupation of the Graetheide and the area around Maastricht and the many similarities or parallels in the development of their material culture (ceramics, flint, lithics) over time (Amkreutz 2014). Even if the Meuse river or smaller streams were not a physical barrier, this does not imply that they were not a social or ideological divide. For example, the terraces east of the Geleenbeek are first-rate grounds for settlement, but no settlements were located here although the other, western bank is almost completely built over by Bandkeramik sites.

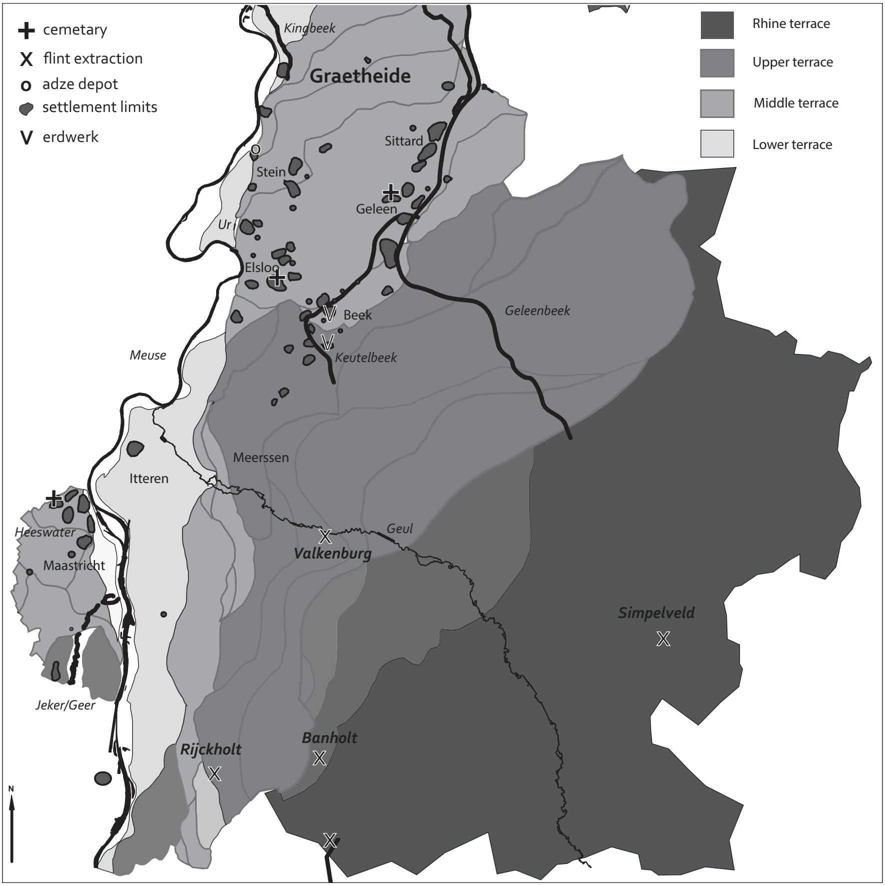

Fig. 13.7 The physical and cultural landscape of the southern Netherlands.

As settlement density grew, other natural features such as dry valleys seem to have functioned as “social” borders as well. By marking their settlement area, Bandkeramik communities also laid claim to the landscape. This is something which hunter-gatherers perhaps had no need to do. Gradually, a cultural landscape arose, divided by natural and social borders. But across that landscape exchange routes were present and maintained, indicating that mobility was not obstructed by these social borders.

The way the natural landscape was used to create social borders befits the way in which the first farmers dominated their environment by using agriculture in order to fulfil their subsistence needs. It also tells us something about the way these first farmers lived within their natural and cultural landscape. It is clear that the first colonists had some knowledge of the area that was to be settled. This was obtained during their first explorations, and from existing contacts with the original inhabitants, the Mesolithic hunter-gatherers. After settling, the land outside the home range (Bakels 1978) of these early farmers was no *terra incognita* anymore. And from the first phase of colonization onwards there is evidence for an in-depth knowledge of the region and its possibilities. The routes of contact and the use of different lithic sources also raises questions regarding the role of the local Mesolithic groups who had lived there for millennia (Van Wijk *et al*. 2014). Still, there is much to be understood about how the Bandkeramik cultural landscape was divided, used, and lived in. Much research has always focussed on the settlements, but they are only a small segment of the cultural landscape, which encompasses so much more. Questions regarding mobility around and between settlements or *Siedlungskammern* might be answered if single finds of adzes and arrowheads within the loess area and surrounding sandy soils, most of them currently in private collections, are given more attention.

Uniform diversity in settlement choices?

The Odyssey project[6] (Van Wijk *et al.* 2014) has led to a more complete picture of the Early Neolithic occupation of Limburg. It filled a gap which Modderman pointed out in his *Diversity in uniformity* publication (Modderman 1988). Central in that publication is the idea that underneath the visible and functional uniformity of the LBK, a meaningful diversity is hidden. Whereas Modderman highlighted the existence of this diversity on a European scale, he lacked substantial background data especially for one of his main research areas (the Euregion), and Dutch Limburg in particular. It is here that the results of the Odyssey project provide a contribution, also with regard to geography and site location choice (Amkreutz 2014). One of the main results is that the Meuse river appears not to have been a physical barrier during the LBK. Even so, this does not imply that it was not a social or ideological divide, as is argued above.

The project also provided evidence for a distinct pioneering phase in which certain areas with “classical” LBK settlement location features (middle terrace position, slightly sloping terrain, and vicinity to water) were uniformly selected. Later, further expansion took place around these pioneering settlements. Importantly, this structure of "infilling" is abandoned during the Late LBK occupation and settlements now also appear on the upper terrace, river valley bottoms, and even at larger distances from open water (Van Wijk *et al*. 2014).

The studies presented in the Odyssey project provided a framework within which processes of uniformity and/or diversity became more apparent. It became clear that the Early LBK system was based on a recognizable uniformity in settlement location choices (Van Wijk 2014) and, from early on, long-distance contacts in raw material procurement, such as flint (De Grooth 2014) and adzes. In contrast, at the end of the LBK a more fragmented system seems to have existed in combination with an increased emphasis on regional and local identity (Amkreutz 2014). The increasing settlement density and patterning in the Graetheide and Caberg regions perhaps made it necessary to create differences in identity and even contest ownership of land and resources. It may therefore have become an even more contested landscape between farming groups, although the role of local Mesolithic groups remains obscure. Social space between groups became smaller, and as a result diversity became larger.

Acknowledgements

This contribution is one of the outcomes of the Odyssey project and has been presented at the EAA in Plzeň 2013 at the session "Something out of the ordinary? Interpreting the diversity in the uniformity of the Early Neolithic Linearbandkeramik in central and western Europe". Although this paper mostly represents my own research for the Odyssey project, I hereby thank my fellow researchers Piet van de Velde, Luc Amkreutz, Marjorie de Grooth, Fred Brounen, and Corrie Bakels for their contributions, sharing of resources, and ideas. They are not implicated in my arguments here and any mistakes are my own. Many thanks also go to the many collaborators in this project (listed in full in Van Wijk *et al*. 2014), without whom the project would not have been possible. I especially also would like to thank Piet van de Velde for broadening my view on social aspects of the LBK and Jan Kolen for introducing me to the possibilities outside the Bandkeramik *physical* landscape.

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Notes

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[1] See Linke (1976) for settlements on the Aldenhovener Platte; also see Claßen (2012).

[2] Geleen–De Kluis (Waterbolk 1958/1959); Geleen–Janskamperveld (Van de Velde 2007); Sittard–Mgr. Claessenstraat (Modderman 1958/1959); Elsloo–Koolweg (Modderman 1970); Stein–Heideveldweg (Beckers and Beckers 1940; Hendrix 1997); Stein–Heidekampweg (Hendrix 1999; Van Wijk *et al.* 2012); Maastricht–Sint Christoffelplein (Dijkman 2000; Van Wijk *et al.* 2014).

[3] It should be taken into account that the original settlement surface sloped less than it does now. After a settlement was abandoned, the absence of vegetation made the terrain more vulnerable to erosion.

[4] The relative ceramic chronologies according to Modderman (1970) and Van de Velde (2012) have been used. It should be stressed that this concerns a relative dating based on changes in pottery decoration. It is not clear how long the individual pottery phases lasted (Van Wijk *et al*. 2014).

[5] Today, neither valley carries any water, but they fill up when there is heavy rainfall, causing a problem in the lower parts of the valleys which now function as a road or are being built up. Colluvium within these valleys is a few metres deep.

[6] The Odyssey project, a research project funded within the National Science Foundation–Odyssey programme, ran from 2010–2014 and was initiated by Archol, the University of Leiden, and the National Museum of Antiquities. The project, titled “The LBK revisited: ‘forgotten’ research into the Bandkeramik occupation of the Low Countries”, was started in 2010 in cooperation with a number of museums, amateur archaeologists, municipalities, and the Cultural Heritage Agency (RCE). The main aim of the project was to resuscitate 14 unpublished Bandkeramik excavations from between 1925 and 2001 from both sides of the Meuse river. The project covers but a selection of a larger set of investigations that have not been published at all, or only to a limited extent.

CHAPTER FOURTEEN

IT'S BETTER TO BURN OUT THAN TO FADE AWAY: A COMPARATIVE PERSPECTIVE ON THE DIVERSITY IN LBK ENDINGS IN THE RHINE–MEUSE REGION

LUC AMKREUTZ

Introduction

Between 5300 and 5250 cal BC the Linearbandkeramik (LBK) embarked on its final push west. With the advent of the Flomborn phase Bandkeramik communities reached the Rhineland, Alsace, southern Limburg, adjacent Belgium, and later on the Hainaut and Paris Basin area (Gronenborn 1999, 185). At the end of this period the LBK covered an enormous area from the Seine to the Dniester (Bogucki 2000; Gronenborn 1999, 185; Whittle 1996) forming an archipelago of, often clustered, settlements in the vast Atlantic "jungle" (Modderman 1988, 85–86).

Recent research has underlined the diversity of the Earliest LBK regarding its origins, expansion, and the role of indigenous communities in the adaptation of "Neolithic" ideas and knowledge (e.g. Lukes 2004, 30; Zvelebil 2004, 199). After this first phase the LBK is split in broad regional traditions, of which the western Flomborn variant is of importance here. Most evidence for the secondary Flomborn phase of LBK expansion points to a very homogeneous development and migration through colonization as a main mechanism for its spread, despite some regional variation (see Bogucki and Grygiel 1993; Cladders and Stäuble 2003; Gkiasta *et al.* 2003; Gronenborn 1999; 2007; Louwe Kooijmans 2007; Lüning 1988; Modderman 1988; also see Kienlin 2006, 146).[1] The material uniformity suggests the existence of an inclusive socio-economic and symbolic LBK "package" for this phase. Ranging from settlement location and structure to house construction, from pottery decoration to agricultural practices, and from long-distance exchange networks to burial tradition, there is a unique distinctness to LBK culture over vast distances (e.g. De Grooth and Van de Velde 2005, 238; Lüning 1988; Modderman 1988), pointing to a distinct and conservative set of social rules and resistance to change, especially in Early Flomborn (Sommer 2001, 255, 260). Although there may be more than one reason (see Zvelebil *et al.* 2010, 303), its existence has been linked to the expansion of the LBK over vast stretches of western Europe, especially from the Flomborn phase onwards. A markedly uniform material culture and its underlying societal rules and socio-symbolical worldview could facilitate the necessary interaction and exchange networks, involving objects, people, and ideas, across these vast distances (e.g. Bickle and Whittle 2013; Bogucki 1988; Frirdich 2005; Gronenborn 1999, 187; Sommer 2001, 257; Whittle 2003).

As a point of departure it could be argued that the Early Neolithic occupation of the Meuse–Rhine area was also characterized by this relatively uniform LBK culture (see Louwe Kooijmans 2007, 295). However, at the same time, changes start to occur within the LBK. These changes are at first most evident in pottery decoration (Pavúk 2005; Pechtl 2015) but eventually also comprise other aspects of society, including for instance raw material distribution networks and territorial access (e.g. Bakels 1987; Bogaard *et al.* 2011; Whittle and Bickle 2013; Zimmermann 1995). The observed changes in material culture reflect a loosening of societal rules regarding some elements of LBK ideology (Sommer 2001, 260), enabling the establishment of more regionally oriented communities (Hofmann, this volume; Sommer 2001). There is as such a distinct increase in the diversity underlying the overall LBK uniformity (Modderman 1988).

The reasons for the development of increased regionalization may have differed across the LBK. They have generally been associated with a period of stress or crises, sometimes following further expansion of settlement clusters and population growth, and archaeologically expressed in evidence for violence, fortification by enclosures, and distinct ritual behaviour (Golitko and Keeley 2007; Gronenborn 2006; Whittle and Bickle 2013, 399). It entailed a marked shift in the overall structure of LBK society, affecting many different fields, only some of which are archaeologically observable.

Aims and outline

The end of the LBK "as we know it" is not synonymous with the overall end of this culture. Beneath the widespread development of regionalization much also stayed the same. At the same time, however, the different processes of diversification that were initiated in this stage ultimately did lead to markedly different trajectories at the start of the fifth millennium. In general there is much evidence of continuity in central and western Europe in the form of subsequent "Danubian" cultures (cf. Childe 1976), such as the Rössen culture in the Rhineland, the Stichbandkeramik in southern and eastern Germany, Poland, and the Czech Republic, or the Villeneuve-Saint-Germain groups in the Paris Basin (e.g. Whittle 1996; Whittle and Bickle 2013, 399), but knowledge of the developments leading to the establishment of these successors and the characteristics of transition is chronologically and geographically limited (e.g. Blouet *et al*. 2013b; Jadin 2003). This can also be said for our understanding of the degree to which these different successors are inherently comparable. Moreover, in some areas, for instance in parts of Belgium and the Netherlands, no clear successor exists for many centuries (e.g. De Grooth and Van de Velde 2005, 239). While the outline of developments on a larger geographical scale is well known, the distinct regional trajectories and their similarities and differences remain to be further researched.

It appears, then, that to come to terms with the developments at the end of the LBK, we need to be aware of the similarities and differences in LBK endings on a regional scale, taking into account more detailed developments in relation to particular geographical and historical characteristics. In this contribution I will focus on the end of the LBK in its most north-western area, the Meuse–Rhine region and adjacent Belgian territory, which shows differences in the development and particularly in the ending of the earliest Neolithic occupation. These vary between post-LBK developments and a degree of continuity in the German Rhineland and some Belgian settlement clusters, and a marked absence in Dutch Limburg and adjacent Belgian sites (e.g. De Grooth and Van de Velde 2005; Zimmermann *et al*. 2005). By comparing the differences and similarities, a better understanding may be developed of the character, role, and repercussions of LBK diversity. This will then enable us to frame questions regarding the end of the LBK and what followed it. This means that the emphasis lies with comparing the trajectories from an interpretative perspective, rather than an in-depth presentation of the Later and Final LBK in the selected regions.

Regional developments on the LBK fringe

I will focus on the occupation cluster in Dutch South Limburg and compare it to its eastern neighbours on the German Aldenhovener Platte, as well as its western neighbours in Belgium and towards the Paris Basin (Fig. 14.1). There are two main reasons for targeting the Limburg study area. First, new evidence regarding its chronology and composition has come to light within the NWO-Odyssey project "The LBK revisited: 'forgotten' research into the Bandkeramik occupation of the Low Countries" (Amkreutz *et al*. 2012; Van Wijk *et al*. 2014b)[2], providing a more complete picture of the Later and Final LBK in this area. Second, Bandkeramik occupation in Dutch South Limburg and adjacent Belgian territory suddenly stops in the first century of the fifth millennium, with a gap of some three centuries to the Rössen culture in the Meuse valley (De Grooth and Van de Velde 2005, 239; Van Gijn and Louwe Kooijmans 2005, 217). It is hoped that understanding Later LBK diversity may also shed light on the enigmatic disappearance of this culture in the Limburg study area. Before comparing the Later and post-LBK trajectories of the three settlement areas, a brief background to the history and development of LBK occupation will be given.

Going west

The occupation of the north-western part of the LBK world is generally associated with the second wave of LBK expansion covering a vast territory from the Ukraine and Poland to the Paris Basin (Gronenborn 1999; Whittle 1996). The settlement of our study area, including the Rhineland, Limburg, and the Belgian settlement clusters, may be placed within this second phase.[3]

At a closer look we see that the Rhineland, and in particular the Aldenhovener Platte settlement area, was occupied during the Early Bandkeramik and developed mainly during the Later LBK (Stöckli 2005, 140; Zimmermann 2002). At the same time there are contemporaneous dates for settlements in nearby Dutch Limburg, such as the sites of Geleen–De Kluis (Waterbolk 1959), Geleen–Janskamperveld (Van de Velde 2007), Sittard–Stadswegske (Modderman 1958/59), Stein–Heidekampweg (Van Wijk *et al*. 2012), as well as at Maastricht–St.-Christoffelplein across the Meuse (Dijkman 2000; Van de Velde 2012; also see Van Wijk *et al*. 2014b, 494), indicating that the cluster on the Aldenhovener Platte, Dutch South Limburg, and adjacent Belgian sites were settled around the same time (Fig. 14.1). The settlers most likely came from further south in the Lower Main area (Hessen), where

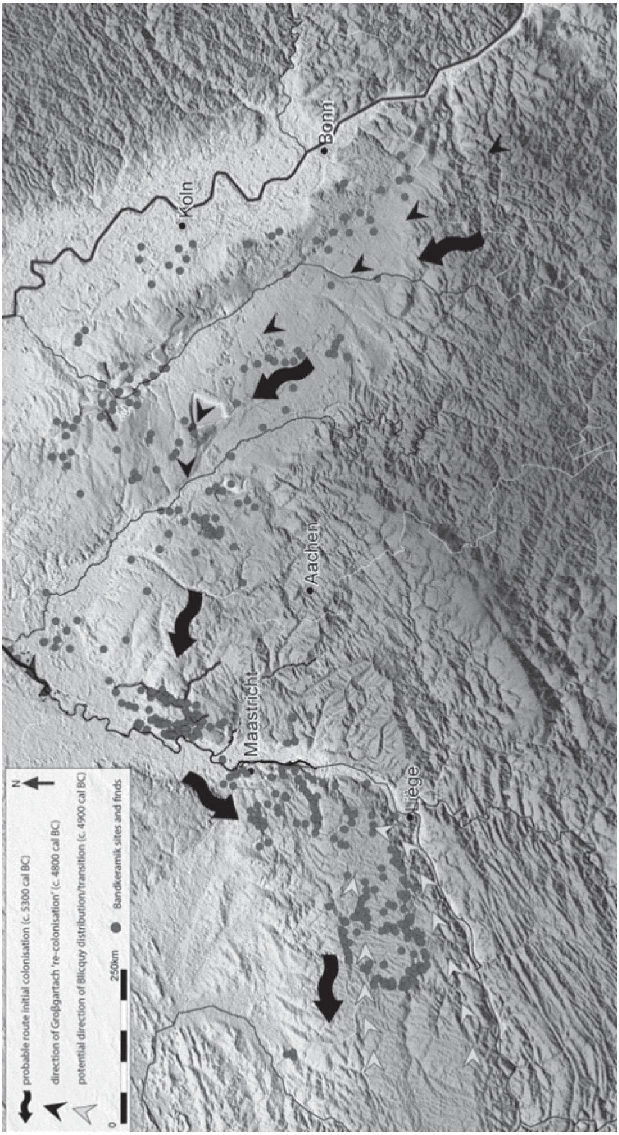
Bonn
Köln
Aachen
Maastricht
Liège
N
probable route initial colonisation (c. 5300 cal BC)
direction of Großgartach 're-colonisation' (c. 4800 cal BC)
potential direction of Blicquy distribution/transition (c. 4900 cal BC)
Bandkeramik sites and finds
0
250km

Fig. 14.1 Map of the wider research area. The Meuse clusters (Graetheide and Maastricht) are highlighted. To the east and west the Belgian and German (Aldenhovener Platte) clusters are visible. Indicated with arrows are the advent of the LBK around 5300 cal BC and the later developments of the Blicquy group and Großgartach (adapted from Van Wijk and Meurkens in prep.).

settlements of the Earliest LBK were found with potential outliers in the region of Bonn (Meckenheim) (Louwe Kooijmans 1976, 234; 2007; Zimmermann *et al.* 2005, 9).

Based on this information it appears that multiple neighbouring settlement areas were probably scouted for, evaluated, and mapped from a considerable distance. This behaviour may be a structural part of the LBK drive to colonize and settle new areas. While new territory was encultured, close social and economic ties to the homeland persisted (Frirdich 2005, 86–92, 99–101). At the same time the founding of settlements in adjacent areas created social relationships and cooperation between nearby groups, lowering risk and providing an opportunity to benefit from produce and other aspects of each individual area. Crucial to the success of the LBK *landnam*, therefore, is the existence of a strong and reliable network of contact and cooperation, which is archaeologically best attested by the presence of raw materials and products that originate elsewhere (e.g. Ramminger 2009; Zimmermann 1995). The existence of these networks has been marked as a typical LBK characteristic (e.g. Frirdich 2005; Gronenborn 1999; Sommer 2001); moreover, it is a distinct ingredient of the LBK *landnam,* as well as an indispensable characteristic of survival in "unoccupied" territory. Hence, strong economic and social relationships will have existed between neighbouring settlement areas or *Siedlungskammern*, especially in the early stages of settlement.

Following the initial occupation, a second phase involves the gradual infilling of the original settlement clusters by founding nearby settlements. This has been attested in the Aldenhovener Platte area as well as for South Limburg on both sides of the Meuse (Bakels 1982; Claßen 2005; Van Wijk *et al*. 2014b, 496). At the same time the cultural or economic need to settle new terrain remained. It is plausible that aspects of competition over land or resources, as well as prestige issues, may have formed additional incentives to keep moving west into Belgian Hesbaye, for instance to Vaux-et-Borset and Darion, or Verlaine–"le petit-Paradis" and Liège Place-St.-Lambert (e.g. Allard 2005; Crombé 2010; Jadin and Cahen 2003a; Jadin and Hauzeur 2003a; 2003b; Van der Sloot *et al*. 2003). Sites further west in the Belgian Hainaut upper Dendre area are now also occupied (Van Berg and Hauzeur 2001), as well as a small occupation cluster in between at Wange and Overhespen in Vlaams Brabant (Lodewijckx and Bakels 2000). Distances are relatively large, those between Hesbaye and the Hainaut area amounting to 100 km (Crombé 2010). While pottery styles link both the Hainaut and Hesbaye groups to the Rhine–Meuse occupation (Jeunesse 2001, 349–350), geographically and culturally there are also associations with the LBK of the Paris Basin, the *Rubané final* (RF) or *Rubané Récent du Bassin Parisien* (RRBP).[4] This group probably originated in the LBK of the Marne valley, which links to earlier LBK occupations in the Neckar region and Alsace (Jeunesse 2001, 373–374) and therefore has a differently rooted trajectory than the Rhine and Meuse clusters (also see Lefranc 2007). Contemporaneous with or at the end of the RF/RRBP the *Groupe de Villeneuve-Saint-Germain* (VSG) and the associated *Groupe de Blicquy* (BCQ) developed, which in turn spread to the Belgian settlement clusters (Ilett 2012; Jadin 2003; Jeunesse 2001).[5]

5000 cal BC: Complex patchworks, but a strong weave

At the end of the Flomborn phase, when LBK occupation had reached western Belgium, evidence of diversification appears in regional pottery styles and economic adaptations (Gronenborn 1999; Modderman 1988). At the same time, however, around 5100 cal BC the underlying uniformity was still the main connecting element. Over vast stretches of western Europe similar locations were settled and farmed, similar economic choices were made, material culture was produced and obtained in similar ways, and socio-economic contact networks for the exchange of objects, partners, and knowledge existed over hundreds of kilometres (Gronenborn 1999, 187; Zimmermann 1995; Zimmermann *et al.* 2005, 11). For the study area, this means we are dealing with a very connected settlement landscape. The Aldenhovener Platte, Graetheide, and Maastricht–Hezerwater clusters can perhaps be interpreted as simultaneous sibling foundations from further south along the Rhine. Expansion within these clusters and beyond, most notably to the Hesbaye and Hainaut areas, should also be related to this. In its expansive mode, be it across unoccupied territory or within and between settlement clusters, LBK networks, products, and traditions were the socio-economic "glue" enabling this system to function (also see Sommer 2001). This means that the settlement clusters at the north-western extent of the LBK territory were strongly connected in a social and economic respect, shared similar values and beliefs, probably partially had a common ancestry, and were co-dependent. This settled LBK landscape at the north-western extent of the loess zone was rooted in cultural values and traditions that originated several centuries earlier in central Europe. It is at this point that we take a closer look at the developments in the three zones of LBK settlement.

LBK along the Meuse: the Graetheide and Caberg–Hezerwater cluster

The LBK in Dutch South Limburg starts around 5250 cal BC with pioneer settlements at Geleen, Sittard, Stein, and Maastricht in phase 1b (Modderman 1970; Van Wijk *et al*. 2014b). The image of occupation is distinctly “classic”, sites situated on the gently sloping middle terrace of the Meuse or, in the Graetheide cluster, near the Meuse tributary of the Geleenbeek. Similar locations are selected on the western bank on the upper terrace around Maastricht–Caberg. Site locations conform to the valley–water–loess niche (cf. Bakels 1978, 137; 2009, 52, 93; Whittle 1996, 160) or *Lössgesetz* (Lüning 1982a, 13). While during the first phases the number of settlements appears to be stable, there is a sudden increase almost doubling their numbers during phase 2b/2c (Bakels 1982; Van Wijk *et al.* 2014b). It is suggested, based on estimates of the amount of arable land and pasture needed, that the different villages had to share their surroundings in these later phases, both for agricultural purposes as well as resources (Bakels 1982, 40). This may have placed a strain on cooperation, access to raw material, territorial issues, and eventually social cohesion. The problem with this hypothesis is the number of assumptions it is based on. These include the degree to which the number and location of known settlements is representative of their overall number and distribution. For instance, erosion and colluviation may skew our perspective, while built-over and largely inaccessible areas prevent large areas from being investigated. Also, much of the chronology and dating of individual settlements is based on the evolution of pottery decoration, but settlements and even individual pits may contain multi-period ceramic waste, or simply not enough sherds for an age estimate (also see Van de Velde 2012; 2014, 117–125). Despite these inhibitions, the overall trend is robust enough to give some idea on the settlement development of the Limburg cluster, which will now be discussed.

Phase II developments: breaking the rules?

It appears that the Early Flomborn sites are generally located on the middle terraces at a distance of less than 750 m from fresh running water. These are usually small streams such as the Heeswater, Geleenbeek, Ur, Jeker, or Keutelbeek. The sites are often situated on gentle slopes exposed to the south (see Van Wijk *et al*. 2014b, 495). This specific uniform settlement choice may be related to the fact that this area was now part of a new stage of LBK expansion and that known, well-tested, and “safe” location characteristics were sought out in this pioneering phase (Van de Velde 2008; Van Wijk *et al*. 2014b, 496). Distinct infilling around the first pioneering settlements follows in phase 1c–1d, with later expansion around Elsloo and Sittard as well as sites further away, both to the north and the south. Around Maastricht a southern expansion is witnessed towards the Cannerberg and the Jeker–Geer valley. The location of settlements also changed. On the Graetheide, site locations on the upper terraces are now included as well, sometimes even close to the edge of the loess and at a large distance from open water (2 km in the case of Geleen–Urmonderbaan) (Van Wijk *et al*. 2014b, 496; Van Wijk, this volume). Even more remarkable is the expansion into the Meuse valley at sites such as Eijsden–Schansweg, Itteren–Sterkenberg, and Nattenhoven (Amkreutz 2004; 2006; 2010; Brounen and Rensink 2006; De Warrimont and Schins 2014). In these cases distinct floodplain locations situated at or near the channels of the Meuse were tested and used. While the vicinity to the Meuse may have been beneficial with respect to fresh water, fishing, and transport opportunities, there were also downsides, as arable land could have been more limited and occasional flooding was a distinct possibility.

One factor in this “pushing of the envelope” (cf. Amkreutz 2010, 539, 541) could be the peak in contemporaneously occupied settlements in phase 2b, with most sites occupied into phase 2c (Van Wijk *et al*. 2014b, 496–497). The number of settlements in the Graetheide area and perhaps the Maastricht cluster could simply have outgrown itself and tipped the balance in the equilibrium of shared geographical and social territory, as proposed by Bakels (1982), forcing part of the occupants to move into less favourable or at least less traditional locations.

While numbers seem to be a factor, there are other developments. A very notable one is the establishment of several enclosure systems, or *Erdwerke*, for instance at Beek–Beekerveld (Brounen and Rensink 2007), Beek–Kerkeveld (Van de Velde *et al*. 2009), and possibly Maastricht–Caberg (Van Wijk and Amkreutz 2014, 147–177). While enclosures fit with the LBK tradition of building and investing in communal projects (such as houses, field systems etc.), they have different, defensive and fortificatory connotations. While some have argued for protection from conflict with hunter-gatherers (e.g. Golitko and Keeley 2007), sites such as the Talheim pit in Baden-Württemberg and Schletz in Austria suggest conflicts between neighbouring LBK communities, involving raids and tribal warfare (e.g. Price *et al*. 2006; Whittle 1996, 170–171). Since bone preservation is virtually absent in the decalcified loess of the study area, positive evidence for actual conflict is largely missing. One exception is burial (EL–87) at the Elsloo cemetery (Modderman 1970). It contained the body silhouette of, probably, a woman with an arrowhead wedged in the cranial region (Van de Velde 1995; 1997; 2011, 59). The cemetery in itself may also be a manifestation of the changes taking place in the Later LBK and their social repercussions.

Apart from these indications for population pressure and perhaps conflict, there are also changes in material culture and raw material procurement, for instance regarding pottery. Based on Modderman's investigations (1970, 197) it is clear that the decoration types on the vessel walls and rims significantly increase in the later phases of the LBK (phase 2c/d) and that there are distinct regional differences to other settlement clusters (Gronenborn 1999; Hofmann, this volume; Lefranc 2007; Pavúk 2005; Pechtl 2014). Pottery increasingly seems to have become a vehicle for differentiation. The recent investigations within the Odyssey project (Amkreutz *et al*. 2012; Van Wijk *et al*. 2014b) further demonstrate that even *within* the Limburg settlement area, minor differences occur in the later phases regarding clay composition and decoration styles on either side of the Meuse, with the western side displaying imports or inspiration from Hesbayan or Paris Basin sites (Van Wijk *et al*. 20014b, 499–501). At Maastricht–Klinkers, feature 1h, dating to phase 2c, contained a large number of pots that can be considered imports from elsewhere (Van de Velde in Van Wijk *et al*. 2014a, 247; Van Wijk *et al*. 2014b, 498). I will return to its potential implications below.

These emerging differences are further substantiated by the evidence from lithic raw materials. In the earlier phases most adzes were made from amphibolite (from central Europe) and later on basalt (potential sources near Bonn) (Bakels 1987; De Grooth 2005, 288), testifying to the exchange networks characterizing the LBK during its expansion and tying villages in our study area (indirectly) to sometimes very distant procurement sites, such as the Bohemian Izera mountains (Ramminger 2009, 93). During the later phases more and more adzes were made on more local or regional raw materials, such as quartzite from Horion–Hozemont (near Liège) or lydite from Ceroux Mousty (south of Brussels), and even river gravels from the bed of the Meuse (Bakels 1987). This regionalization and even localization becomes even clearer for flint sources (see De Grooth, this volume). Based on the results from the Odyssey project (Amkreutz *et al*. 2012; Van Wijk *et al*. 2014b) it appears that in the earlier phases settlements on either side of the Meuse used Lanaye-type flint of the Banholt variety (often termed Rijckholt flint). This material, the main source of which was situated at Banholt several kilometres south of the Graetheide cluster and on the eastern side of the Meuse (De Grooth 2011), was also distributed to the Aldenhovener Platte settlements and further on (Gronenborn 1999, 168; Van Wijk *et al*. 2014b, 516). In the younger phases, Lanaye (Banholt-type) flint remained popular, but lithic raw material compositions began to differ. For instance, virtually no use was made of (rolled) terrace flint in settlements in the Graetheide cluster, whereas this was frequently used in settlements around Maastricht (in spite of the presence of better-quality flint nearby) (Van Wijk *et al*. 2014b). Moreover, there are also distinct differences by site. At Maastricht–Klinkers for instance, a large percentage of the lithic inventory is made on non-Banholt types of flint, including Rullen, Valkenburg, and Hesbaye-type flint, whereas at other sites these form the exception (Van Wijk *et al*. 2014b). At the Younger LBK sites, therefore, lithic composition differed by settlement, by generation, and sometimes even by household (Van Wijk *et al*. 2014b, 509). De Grooth (this volume) therefore argues that since lithic resources were not exhausted and do not clearly belong to territories on either side of the Meuse, they may now have played an important role in creating differences and diversity. Procurement and use of different raw materials and flexibility in choice formed a means of creating a distinct social identity for each settlement or even household.

In conclusion, during the later phases of the Younger LBK in the Limburg, there is increasing diversity which develops during a period of marked increase in the number of sites. These developments range from diverging settlement location choices, over settlement layout, to investment in features such as cemeteries and enclosures. Simultaneously, pottery shape, production, and decoration change or diversify, whereas raw material procurement becomes increasingly local and diverse, apparently relating more to matters of identity than to availability. Surely this must lead somewhere.

On the ending of the LBK in the Limburg area

Except it doesn’t. At the end of LBK phase 2c, the number of house sites already diminishes and during phase 2d, both in the Graetheide cluster on the eastern side and for the settlements in the cluster around Maastricht, occupation ends abruptly (e.g. De Grooth and Van de Velde 2005, 239; Louwe Kooijmans 2005, 251; Modderman 1970, 198; 1988; Van Wijk *et al*. 2014b, 502). Despite some isolated finds it is only with the discovery of the, so far only, Dutch Rössen settlement of Maastricht–Randwijck in the Meuse valley, dating to c. 4600 cal BC (Bakels 2008; Louwe Kooijmans 2005), that the Neolithic “continues”. While it may be argued that the absence of any direct successors to the LBK may be due to post-depositional reasons or different site location choices (Louwe Kooijmans 2005, 251), the impressive amount of fieldwork conducted in the area in relation to large-scale projects against flooding, both on the Graetheide plateau and recently around Maastricht as well as in the Meuse valley (e.g. Brounen and Rensink 2006), quite convincingly argues against this. The absence of evidence in this case appears to be significant.

To date no satisfactory explanation has been given for the LBK's disappearance. Several causes have been discussed, ranging from soil exhaustion, drought, and deforestation, over epidemics to overpopulation and increasing social stress due to increasing hierarchy and outside pressures (De Grooth and Van de Velde 2005, 239; Farrugia 2002; Richter 1997). While recent research has underlined the significance of external push factors such as climate (Gronenborn 2007; 2010; Gronenborn *et al.* 2013), the overall evidence points to the ability of communities to flexibly deal with (relatively rapid) change (Folke *et al.* 2010; Stäuble 2014). Therefore the accent should rather be placed on motivations that lie within the LBK culture itself and that relate to the process of diversification that characterizes its later phases. In that respect it may be insightful to take the developments in the neighbouring settlement regions into account.

A view to the east: developments on the Aldenhovener Platte and in the Rhineland

In the Rhineland, the initial stages develop in a largely similar way. Most evidence is available for the Aldenhovener Platte and in particular the well-excavated Merzbach valley settlements (e.g. Lüning 1982a) which were settled by "colonists" from the Rhine–Main area (cf. above; Zimmermann *et al.* 2005). The detailed excavations of some of the settlements enabled the identification of 14 (I–XIV) LBK house generations of roughly 25 years (Claßen 2009, 97). The settlement history here also starts with five to six pioneer settlements in the eastern part of the Aldenhovener Platte (including Langweiler 8, Weisweiler 17, Lohn 3, and Lamersdorf) (Zimmermann *et al.* 2005, 16). Subsequently, new settlements were established in the direct vicinity of these sites, while other pioneer settlements were founded further north, mostly oriented on the small streams in the area, for instance the Merzbach or Schlangengraben (Claßen 2009, 98). Other settlement clusters in the entire Rheinische Bucht region are situated at distances of 10–20 km (Zimmermann *et al.* 2005, 20). Following this pioneering phase the existing settlements further grew and new ones arose. Around phase X a threefold settlement system developed, consisting of a main settlement, several secondary sites, and single farmsteads or *Einzelhöfe* (Zimmermann 2002, fig. 11). It has been argued that especially the older settlements may have fulfilled a central role in the settlement system, related to production and exchange networks and perhaps rights to land and grazing grounds (Zimmermann *et al*. 2005, 32–33). In time this may have brought tensions between settlements and families. Two generations onwards occupation density peaks around 5000 cal BC with about 1250–1350 household units for the entire Rhineland (Claßen 2009, 98; Zimmermann *et al*. 2005, 34; also see Lüning 1982a, 23). What happens next to some extent mimics the developments in the Limburg area, as occupation density drastically plummets within a century. For the wider Aldenhovener Platte area the number of houses drops from c. 38 to c. 30 in the following generation (XIII) and some 20 in the next. Only a small number of houses post-date this phase. It is argued that the wider Rhineland area was subsequently abandoned for 50 years to almost a century until the middle phase of the Großgartach culture (GG) (Zimmermann *et al*. 2005, 34) (Figs 14.1 and 14.2). The absence is mirrored in a regeneration of the woodland, pointing to reduced settlement activity in the area (Claßen 2009 98; Kalis and Meurers-Balke 1997, 35).

The suggested reasons for this crisis are manifold. In the later phases differences in house construction, pottery decoration, and settlement structure are witnessed. This seems to point to potential conflicts between older and younger generations (Zimmermann *et al*. 2005, 32) but not necessarily to socio-economic stress. Over time, however, we see the development of cemeteries, mostly related to the older founding settlements (such as Niedermerz 3, e.g. Van de Velde 1990). In view of the expanding population, issues such as soil exhaustion, space for new fields and satellite sites, grazing rights, and position in raw material networks may have increasingly led to conflicts. These now would have taken place between settlements and families, rather than generations (Zimmermann *et al*. 2005, 32). Perhaps the building of enclosures at this point can be interpreted in this respect, although perhaps they functioned as central places (cf. Zimmermann *et al*. 2004; 2005) rather than as defensive structures. It is this fixed system with distinct rights that starts to lose its balance around 5000 cal BC when the Rhineland settlements are at their climax. While the increased diversification witnessed in pottery decoration and crumbling networks can be seen as a result of this, these are at the same time part of the problem, as these developments in the LBK sphere did not occur in isolation. The long-distance networks that facilitated socio-economic needs break down because of developments in other settlement clusters. For the Rhineland, the developments in the Rhine-

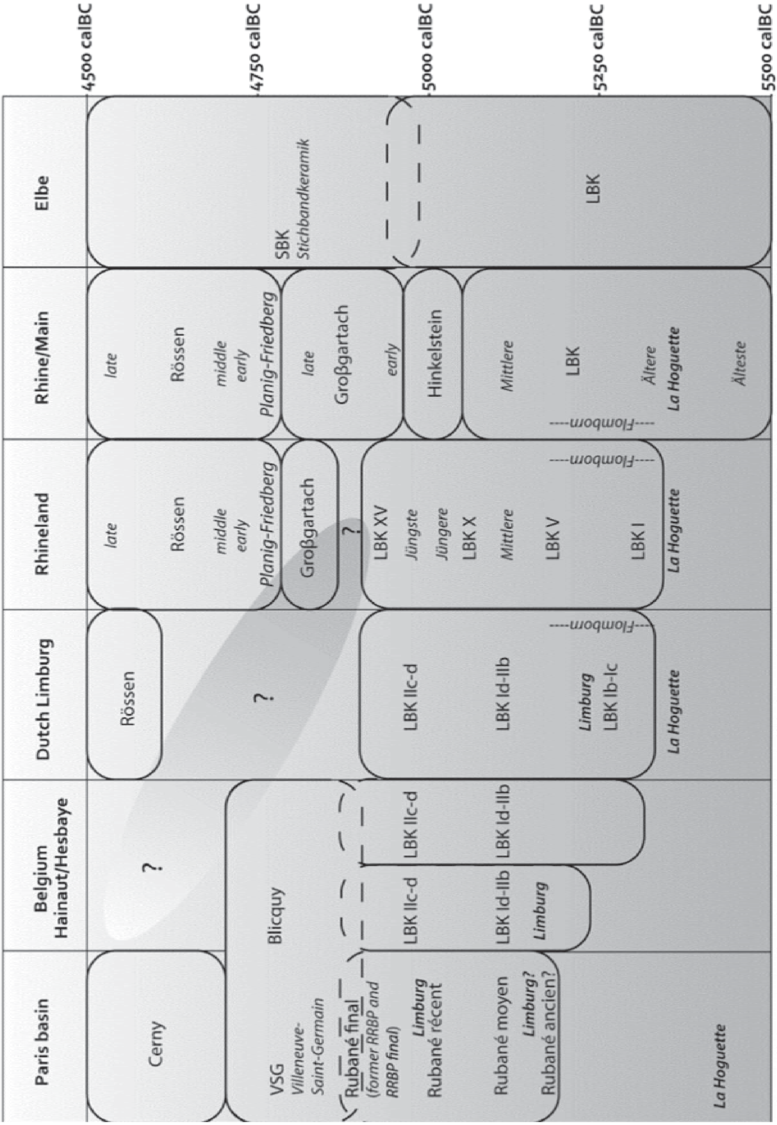

Fig. 14.2 Relative correlation of sequences in the Rhineland, Meuse area, and Belgian area in relation to the Paris Basin and the Rhine-Main area (information from Blouet *et al*. 2013a; 2013b; Gronenborn 1999; Ilett and Meunier 2013; Jeunesse 1998; 2001; Louwe Kooijmans 2006; Meunier 2012; Zimmermann *et al*. 2005).

Main area further south are of particular importance in this respect, as the development of the Middle Neolithic Hinkelstein style (HST) there marks important socio-economic changes.

As argued by Gronenborn (2007, 85), the new HST pottery tradition develops in the Rhine-Hessen area around Mainz, subsequently spreading south into the Neckar valley. In the Rhineland, HST pottery is only known from several imports, for instance in Köln–Lindenthal (Zimmermann *et al.* 2005, 34). The reasons for its development remain unclear. Some associate it with climate fluctuations around 5100 cal BC and the resulting economic instability (Gronenborn 2007, 85; 2010, 70–71; Gronenborn *et al*. 2013). The mass burials at Talheim and Schletz and the strange rituals at Herxheim, including ritual killing and the import of pottery from far-off LBK regions (see Zeeb-Lanz and Haack, this volume), may point to such a period of conflict and stress and may have included a change in ideology and subsequent clashes with more conservative elements (Gronenborn 2006; 2007).

A new beginning?

As argued above, the Rhineland areas may have been abandoned for several decades (although this cannot be completely proven), while further south (in the Neckarland and Rhine-Hessen) there is continuity from the Late LBK, over HST and GG to Rössen (although this does not imply absence of conflict or stress). The Rhineland only witnesses renewed occupation during the middle phase of GG at sites such as Hasselsweiler 1 and 2 and Hambach 260 (Zimmermann *et al*. 2005, 34, 37). The decrease in settlement area in the Rhineland has been hypothetically interpreted by Zimmermann *et al*. (2005, 36) as a flux of women seeking marriage partners further south, where potentially attractive innovations such as new pottery styles and house construction took place. The population in the Rhineland may have suffered from the lack of marriage partners, increasing internal conflict. In any case, at the time of the Middle Neolithic repopulation of the Rhineland, socio-economic and cultural changes had taken place that break with LBK tradition (also see Spatz 2003). These include changes in pottery decoration and style, burial ritual, house construction, settlement structure, and site location choice. Of note is the fact that on the Aldenhovener Platte the old LBK settlement locations were distinctly avoided and settlement took place at a distance from these.[6] Also the association with the loess plateaus and watercourses is abandoned and sites are now also situated on the valley floors and on the central parts of the terraces (Bakels 2009, 55, 64). House size changes, probably including larger, extended families (Lüning 1982b) and settlements increased in size, but exhibit less place continuity (Zimmermann *et al*. 2005, 39). Over time, the settlement area expanded, as settlements grew into clusters with 10–30 km in between and population increased to Late LBK levels during Late Rössen. Economically there are indications for increased livestock farming (Zimmermann *et al*. 2005, 40, 42) and naked barley and bread wheat are added to the crop spectrum (Bakels 2009, 55–57). For the pottery, the intensive decoration on HST vessels later decreases with Rössen and Bischheim pottery. In contrast to the increasing regionalization in pottery decoration during the Rössen culture, GG pottery is uniform across various regions. As with the Earlier LBK Flomborn phase, this coincides with a period of geographical expansion (Zimmermann *et al*. 2005, 43). Concerning raw material networks there has also been a distinct change, as the LBK network of Rijckholt type flint and the importance of larger settlements in the distribution networks is replaced in the Rössen culture with a network focusing increasingly on Rullen flint (Zimmermann *et al*. 2005, 44).

For the Rhineland it may be concluded that part of the developments taking place are similar to those in the Limburg area. There is evidence of population expansion, settlement hierarchies, and an infilling of the available space in combination with increasing regionalization and diversification. While the Rhineland may not be completely abandoned, the number of households drops dramatically and only recovers during the GG phase. By then largely new communities occupied the region. While they may have been ancestral to the area, these people brought new customs and traditions, settled new land, with new crops in new locations, and were organized in new buildings, in larger settlements, with different material culture, resource networks, and probably socio-cultural behaviour.

A view to the west: Belgian sites and the Paris Basin hinterland

To the west other developments take place. As the area around Maastricht was occupied simultaneously with the Graetheide, some of the settlements that were part of the Geer–Hezerwater cluster were probably occupied from pioneering settlements such as Maastricht–St.-Christoffelplein (e.g. Van Wijk *et al*. 2014b, 495–496). Occupation of other settlement sites in Belgian Limburg, the Hesbaye area around Liège, and the small, isolated settlement clusters at Wange and Overhespen in the Kleine Gete area (consisting of three sites) may have subsequently been established from these sites (Golitko and Bosquet 2011, 89). An LBK presence further afield in a second cluster in the Hainaut region (Upper Dendre), and separated from the others by c. 100 km, was established later on and may have been initiated from Later LBK communities in northern France (e.g. Crombé and Vanmontfort 2007, 263–265; Gronenborn 1999, 187; Hauzeur and Jadin 2011; Jadin and Cahen 2003b; Jadin and Hauzeur 2003a; Lodewijckx 2009; Louwe Kooijmans 2007, 295–296). The areas in between appear devoid of settlement, but are characterized by stray finds, such as arrowheads and adzes (Crombé and Vanmontfort 2007, 265; Jadin and Hauzeur 2003b). Here, too, the later periods witness the development of cemeteries (Toussaint and Jadin 2011). Also there are some relatively early enclosed sites at Darion–Colia, Oleye–Al Zèpe, and Waremme–Longchamps (Golitko and Keeley 2007; Jadin and Cahen 2003a; Jeunesse 2011). Although there may be evidence for violence in the form of burnt-down buildings (Golitko and Keeley 2007), other studies argue in favour of a more fluid interpretation (Jadin and Cahen 2003a, 280–290), such as that of former pioneer sites developing into central places, as in the Rhineland. In total, some 200 sites have been discovered in the Hesbaye and Kleine Gete areas (see Jadin and Hauzeur 2003a, fig. 1.1–8), indicative of the gradual infilling of this settlement cluster. In general, developments in the Belgian settlement clusters largely mimic developments further east. However, whereas elsewhere numbers of households plummet and occupation ceases, a different development takes place here.

Blicquy and the question of contemporaneity

This involves the presence of several sites of the Groupe de Blicquy (BCQ), mainly in the Upper Dendre area in Hainaut, but also 100 km further east in the Hesbaye area (Figs 14.1 and 14.2). Many sites are located in the direct vicinity of LBK settlements, such as "le secteur Blicquien" at Darion (Jadin 2003, 477–478), which contrasts with site location choice in the Paris Basin (Ilett 2012, 76). In total, only some 15 BCQ sites have been documented (Jadin and Hauzeur 2003a; Robinson 2010, 290). Again the areas in between the occupation clusters seem devoid of actual settlement, but have yielded quite a number of stray finds (Hauzeur and Jadin 2011; Jadin and Hauzeur 2003a; 2003b; Vanmontfort and Crombé 2007).

The BCQ is the northern part of the VSG complex, which itself stretches into Brittany and to the Loire (Hauzeur 2011, 180–181; Ilett 2010; Jadin 2003).[7] Its material culture is clearly rooted in the LBK, but a number of interesting differences occur. These include the trapezoidal shape of the houses, the different forms, temper preferences, and decoration patterns on the pottery, the different, often local, flint sources used (including Bartonien flint), the combination of an expedient lithic technique with imports, the absence of adzes, and the presence of schist or serpentinite bracelets (Constantin 1985; Hauzeur 2011; Ilett 2010; Jadin 2003). Sites are now in different locations (Ilett 2010; 2012, 69, 75) and a wider array of crop plants, including naked barley and bread wheat, is used (Ilett 2010, 289). Of importance are the suggested close connection between the Paris Basin and the Hainaut area and the indication, at least in pottery technology and decoration, of a relationship between Limburg ware and the development of VSG (Ilett 2010; Meunier 2012; 2013).

There is controversy regarding the chronological position of the BCQ occupation (e.g. Blouet *et al*. 2013b; Constantin and Burnez-Lanotte 2008; Crombé and Vanmontfort 2007; Hauzeur 2011; Jadin 2003; Jadin and Cahen 2003b; Robinson 2010). The available radiocarbon dates and the spatial distribution of both groups argue for a very close chronological connection (Jadin and Cahen 2003b), but contemporaneity is not proven, as there is little evidence for contact between both groups (Fig. 14.2). BCQ could be slightly posterior to LBK, especially since sites are sometimes located so close to (former) LBK settlements (Constantin and Burnez-Lanotte 2008; Crombé and Vanmontfort 2007, 265). In any case, occupied or abandoned LBK sites attracted new occupation and there is clear evidence for the close cultural affiliation between both groups (also see Jadin 2003, 486).

It should also be noted that at several sites outside the loess zone, BCQ finds point to interaction between these groups and local hunter-gatherers of the Swifterbant culture. This has been attested at Kerkhove, Oudenaarde–Donk, and possibly at Bazel–Sluis in the Scheldt valley, as well as at Hardinxveld–Giessendam-De Bruin in the Rhine–Meuse delta (Crombé and Vanmontfort 2007, 265–267; Louwe Kooijmans 2003, 617; Perdaen *et al*. 2011). It could be argued that there was more intensive contact between the BCQ and the local Mesolithic or Swifterbant communities, or that the BCQ system was more open towards interaction. Be that as it may, the last radiocarbon dates for the LBK and BCQ point to 4800 cal BC. While in the Paris Basin post-LBK groups such as Cerny develop, all "Danubian" occupation further north ceased (Crombé and Vanmontfort 2007, 268; Jadin and Cahen 2003b). Final dates for the overall BCQ–VSG complex date to 4700 cal BC (Dubouloz 2003; Ilett 2012). Compared to the Limburg cluster, occupation here may have continued for at least another century.

Discussion

The problem with addressing the question of diversity over an area as large as that covered by the north-western LBK is that it neglects the many details and nuances that characterize the development of the LBK and its transition into other groups in each region. Acknowledging this, the overview above nevertheless indicates that the diversity that arose during the LBK developed into different trajectories in the study area. While these may be compared at a direct material level, it may be helpful to adopt an approach that emphasizes the processes underlying their development. My aim here is to formulate hypotheses regarding the role of diversity and the rather sudden end of the LBK in particular in the Meuse area of Limburg. To this end I will also introduce a theoretical framework, or rather vocabulary, which may facilitate this.

Network theory for a networked culture: some reflections

In the case of the LBK much emphasis lies with the networks that so clearly form its central nervous system (e.g. Claßen 2009; Frirdich 2005) and the way in which these develop, change, or break down. Some studies (e.g. Claßen 2009, 102–103) have dealt with this from a structural point of view, attempting to model relational ties within Social Network Analysis. Here I want to briefly attempt a more interpretative approach focusing on the mechanisms of structure and agency that allow for change to take place.

Often the reason for changes in structure has been attributed to agency, in its simplest form the decision of an individual to make a different choice (see Dobres and Robb 2000). Based on the works of Giddens (1984) and Bourdieu (1977) "agency theory" focuses on the embedded role of individuals within society and the dialectic relationship between the structures agents inhabit and (re)produce, focusing on practices and know-how. The emphasis is on the relationship, or the "social practices ordered across space and time" (Giddens 1984, 2). These practices are of a recursive nature, meaning that "in and through their activities agents reproduce the conditions that make these activities possible" (Giddens 1984, 2). Emphasis also lies on the knowledgeability of the actors involved (Whittle 2003, 10–11), which enables them to reproduce as well as transform the structures they inhabit. This can involve objectified practices such as rituals, but mostly is founded on practical consciousness (Rowlands 1993), or *habitus* (cf. Bourdieu 1977), operating in different social theatres or fields. The rules and codes of these fields regulate social behaviour and relate to the intuitive "know-how" which enables agents to "attune" their habitus to the demands of the field.

While there are limitations to its applicability, agency theory (cf. Whittle 2003, 11–13) does accentuate processes. This is clarified by Barrett (2000; 2001) when he differentiates between structural conditions and structuring principles. The former imply all conditions which agency may once have "inhabited", such as certain landscapes, environments, material structures, resources, available technologies, and systems of symbolic order (Barrett 2000, 65–66). These (archaeologically perceivable) conditions have their own historical development generated through (often repetitive) practices. While conditions ordered the world agents lived in, they themselves did not do anything. On the other hand, structuring principles are the means or ideas that developed over time for successfully inhabiting these structural conditions. They involve the knowledgeability (including knowledge, motivation, skill, and self-determination) which allows for the reproduction of identities and conditions of existence (Barrett 2000, 65–66). It is difficult to arrive at an archaeology of structuring principles (or fields of social practice), as it involves the way in which structural conditions were inhabited. They have to be inferred from an analysis of the data, in particular by the (changes in the) way structural conditions were inhabited.

Actor-network theory

As argued, networks are central to understanding the LBK. As such, one way to understand the structuring principles of these communities and the changes within them is by grasping how communities function in networks in which commodities, innovation, and ideas are implemented or re-interpreted. A useful methodology originating from sociology is actor-network theory (ANT), which approaches reality as a network consisting of actors, who may be animate or inanimate; people, objects, and places may all participate (Callon 1986; Latour 1993; 2005; Law 1992; see Hoogsteyns 2008 for an extensive review). Material aspects, but also ideas or concepts, are included, endowed with agency, and interact in relation to each other. Participants and relations are subject to ongoing redefinition, ordering, and interaction (Callon 1986; Latour 2005, 71; Law 1992). New actors are constantly redefined or "translated" and relations between actors are re-established (see Callon 1986).

Both Callon (1986) and Latour (2004) have tried to phase the dynamics at play in a network when new actors are introduced, focusing on the processes of translation when new actors, their identity, and their implications are negotiated by the existing participants in the network (Callon 1986, 200–214; Law 1992). Three stages are identified. The first is amazement and problematization. A new actor arrives, its identity and implications are researched, and other actors involved are identified. The existential rights of the new actor are questioned. Acceptance depends on the redefinition of alliances and existing relationships between other participants. The second phase (cf. Callon 1986) involves the negotiation of the place the actor may assume in a network. This phase involves societies allowing or preventing change and new habitus. A third phase sees the incorporation of the new actor in the network. This involves a process of translation aimed at redressing the balance and settling the new actor among the existing structures without disrupting them (see Latour 2004, 109). The network is redefined. The new actor is now accepted and has become a functioning participant. All existing actors in the network interact with it and vice versa.

Summarizing, a phase of "acquaintance", in which new actors are probed and have limited impact, is followed by a phase of "attunement" with potential disruption of the existing structure, which may in turn be followed by a phase of "integration", in which a new equilibrium is reached (see Amkreutz 2013, 449–450). These considerations offer a grammar for understanding the processes at the end of the LBK.

Developments around 5000 cal BC: regionalization and the role of diversity

If we compare the different regions, then it is striking that around the same time similar developments occur. Contrasting with the uniformity and drive of the Flomborn expansion (e.g. Gronenborn 1999), the LBK around 5000 cal BC seems to have come to a halt. The expansion and colonizing of new regions which formed one of its main characteristics had ended. What can be witnessed in the various regions along the north-western distribution of the LBK is a stabilization of the system, combined with an increased emphasis on regional and local identity. The LBK system became, as it were, "anchored" (Amkreutz in Van Wijk *et al.* 2014b). This growing sense of home has been documented in the Graetheide and adjacent Maastricht clusters by the increased infilling of the settlement system, and similar developments apply to the Rhineland and the Belgian cluster as well. While the economic limits in terms of space and resources were perhaps not yet crossed, this may have been different for the social ones (see Van Wijk, this volume). This may have been the cause for increased diversification in pottery decoration, resource procurement, and eventually less “classical” settlement location choices. Zimmermann *et al*. (2005, 32) argue that conflicts may have increasingly become territorial, developing within generations and between villages and families. Perhaps too many of the younger generations over time did not move out far enough, disturbing the delicate balance that a “moving” and colonizing settlement system provided.

As a consequence of this process the erstwhile strict societal rules that helped shape LBK communities and facilitated long-distance contact and interaction became more and more obsolete (Sommer 2001). While there is evidence that older “traditional” sources such as Rijckholt-type flint, or adzes of amphibolite, still travelled the “Danubian” network, more and more emphasis was placed on more regional opportunities. Tellingly, some of the central distribution sites in the hierarchical settlement system of the Aldenhovener Platte appear to lose their status (see Zimmermann *et al*. 2005) and with them probably did the individuals that controlled such a system, its knowledge, and rights.

The process of diversification has been documented over a large area and included areas further south along the Rhine (e.g. Hessen), as well as the RF/RRBP communities in the Paris Basin in the west (Gronenborn 1999; Meunier and Ilett 2013, 417; Zimmermann *et al*. 2005). This means that our study area was not isolated, or rather became isolated just as much.

From a societal perspective, this process of diversification appears very much intentional. It facilitated the creation of identity at lower scales and thereby a loosening of “traditional” ties. It did also have two important ramifications. First, autonomous decisions were made at increasingly lower levels, for instance that of village, family, or even household. Second, following on from this, an increasing “noise” in communication between settlements and clusters emerged, which socially may have played out in the creation of different alliances and systems of cooperation. It has been argued that the number of divisions occurring in different spheres of life may point to competing clans or lineages (Bogaard *et al*. 2011).

The structural conditions the LBK inhabited in these areas only changed to a limited extent (it became more crowded, other locations were chosen etc.), but the structuring principles, the way communities inhabited those conditions, changed. In many cases, such as choosing new types of locations, resources, and designs, changes in habitus were required, and since these were sanctioned at lower levels they increased the diversity in the patchwork of the Late LBK. Focusing on the networks, a number of new “actors” could be defined, such as new resources, increased interaction with non-Bandkeramik communities, and perhaps enclosures. It appears that these aspects were more easily attuned and integrated, perhaps because they no longer needed to fit within a supra-regional format (see Sommer 2001) and could be decided at a village or household level. Not going into the details of the role of La Hoguette and Limburg pottery (see Hofmann, this volume; Meunier 2012; 2013), it is clear that the changes that were sanctioned were mainly variations on the original Bandkeramik theme and fitted the original repertoire. In contrast, distinctly other elements such as Hinkelstein ceramics or other pottery from farther away (e.g. Van de Velde in Van Wijk *et al*. 2014a, 246; Zimmermann *et al*. 2005, 34) only exist as isolated imports. Similarly, if groups such as the geographically congruous BCQ were contemporaneous, then they were not interacting much with the LBK (e.g. Crombé and Vanmontfort 2007; Hauzeur 2011). So, it appears that the diversification that developed around 5000 cal BC in the north-western part of the LBK distribution was mainly an internal process that rapidly led to increasing regionalization and an “inward” perspective. The divergence from the original LBK societal rules may have provided increasingly less opportunity to settle conflicts harmoniously as the differences between “us” and “them” increased at a smaller scale.

Renewal and recomposition

What happens next is a story of success and failure. The increased diversification in the Rhineland and the Meuse appears to have coincided with an increase in stress, after which the system collapses. For the Dutch situation, settlement density reaches a peak during phase IIc and strongly diminishes during IId (see Van Wijk, this volume; Van Wijk *et al*. 2014b, 496); similarly, on the Aldenhovener Platte house generation XII seems to form a breaking point (Claßen 2009, 98). Whatever the reasons were, they were insurmountable and eventually, once population numbers crashed, will have affected social interactions surrounding marriage, affiliation, and offspring. Within the span of some two generations, the LBK in this region would no longer be viable in its traditional composition. One could hypothesize that the changes in structuring principles diverged to the extent that increasingly less interaction between settlement clusters, and perhaps even between villages and lineages, became possible, while these previously were crucial to survival. It is not yet clear how the developments of the Meuse clusters relate to the Rhineland, although there are attempts to correlate the chronologies (see e.g. Van de Velde 2014). Either way, the collapse of one may very well have dragged along the other. The developments for the Belgian sites are less clear. The Hesbaye sites along the Geer–Jeker also expanded during 2c (see Van Wijk *et al*. 2014b, 497) and may have witnessed the same collapse shortly after. However, problems with absolute and relative chronology hamper the discussion.

Geographically distant from our study area, the LBK in the Paris Basin and in the Upper Rhine area (Neckarland and Rhine-Hessen) also witnesses a crisis, but develops into new cultures with a "vocabulary" that is clearly rooted in the previous period, but has an identity of its own: Blicquy/VSG and Hinkelstein (e.g. Ilett 2012; Jeunesse 2011; Zimmermann *et al*. 2005). It is a distinct phase of recomposition (Meunier 2012, 14).

Jeunesse (2011, 184–187) argues that the changes during the end of the LBK, in particular the evidence for violence and ritualized behaviour, are epiphenomena of a more fundamental malaise that involves a fixed symbolic system dissolving before it reconstructs itself according to new values and ideas. This also means that the icons of the old system, such as burial ritual and pottery decoration, are attacked and changed. It is therefore primarily a social and symbolic change initiated by groups or elements that no longer felt at home in the old LBK oecumene. They left the usual sites and cemeteries and changed their practices in order to create something new. However, after such a period of chaos and turmoil there is a new need for order, stability, and social cohesion, which would in our case find expression in the Großgartach culture. As argued by Jeunesse (2011, 188) it again demonstrates a uniform style, homogenous burial rituals, and covers an area previously characterized by seven Late LBK stylistic regions, including the Rhineland (see Zimmermann *et al*. 2005). Similar to the transition between the Älteste LBK and Flomborn, the HST–GG development displays similar contemporaneity between old (LBK) and new (HST), followed by a more uniform identity and system of symbols (GG) that is again ideally suited for expansion and long-distance contacts (see Gronenborn 1999; Zimmermann *et al*. 2005, 42).

It is probably not too far-fetched to assume a similar process further west in the Paris Basin. There, BCQ/VSG develop in the RF/RRBP and subsequently expand over an extensive area, into Belgium, towards Brittany, and towards the Loire (Ilett 2012; Ilett and Meunier 2013; Meunier 2012, 14–15; 2013). Indeed, both regions have already been compared on these grounds (Constantin and Ilett 1998).

An important point addressed by Jeunesse (2011) is that at the heart of these changes are the destruction of symbols and the creation of a new identity and ideology. Jeunesse (2011, 184–185) even argues that the many other changes in economy, settlement structure, or house building would in themselves not have disrupted the existing LBK world if they were not the result of a deliberate change in symbolic system and the choice of a new ethnicity. Be that as it may, if one adds up the changes in different fields they are obvious and impressive compared to the Later LBK, despite its internal diversity. They involved fields as diverse as burial architecture, burial position, grave goods, personal adornment, house construction, settlement structure, site location choice, territorial expansion, lithic toolkit, stone tool use, lithic raw material procurement, the role of herding, and the crop spectrum. One could argue that most of these aspects are variations on what is still largely a "Danubian" template: naked barley is just another crop and a trapezoidal longhouse is still a longhouse. However, all these elements also indicate distinct changes in structuring principles (cf. Barrett 2000; 2001) and an altered "habitus" (cf. Bourdieu 1977) in many different fields. Thus, the "attunement" and "integration" of such a multitude of new actors (in the sense of ANT theory) implies the presence of very dynamic, open-minded, liberal communities, at least for a certain period of time. While these changes will in themselves have caused enough of a stir, elsewhere communities were confronted with something profoundly alien. The rapid distribution of GG, "extinguishing the last hearths" of the LBK world, as Jeunesse (2011, 184) has put it, seems little surprising in this respect, and this may have been similar for the BCQ/VSG situation. Whatever was left of the older communities no longer had any network sizeable enough to be able to refuse or integrate what they were confronted with.

Recolonization and confrontation

Returning to the Graetheide and Maastricht clusters, it is clear that interpretation is to some extent hampered by the problems in absolute and relative chronology (see above). What is evident is the drop in households in the Rhineland from phase XII onwards and a resettling during the middle phase of GG (Claßen 2009; Zimmermann *et al.* 2005). At least partially simultaneously, the clusters along the Meuse witness maximum expansion during phase 2c and seem to implode shortly after around 4900 cal BC.[8] For the Belgian clusters the appearance of a number of BCQ settlements demarcates a last phase of "Danubian" settlement. Geographically they border on the territory of the Maastricht cluster on the western side of the Meuse (see Jadin 2003). Around 4800 cal BC (cf. Crombé and Vanmontfort 2007), about a century later, LBK and BCQ occupation seems to end here as well (Fig. 14.2).

In spite of chronological uncertainties, a number of suggestions are worth mentioning. First of all, there was probably not one overarching reason for the disappearance of the LBK, such as soil exhaustion, deforestation, epidemics, violence, or overpopulation (De Grooth and Van de Velde 2005, 239; Richter 1997). The role of an external push factor or "prime mover" (such as climate, e.g. Gronenborn 2007) should moreover be nuanced by the degree to which the increasingly flexible LBK was able to adapt to changing circumstances. This is argued by studies placing the explanation for change with the internal dynamics and the adaptive cycle of societies (Zimmermann 2012), or with the degree to which communities managed to deal with changes (e.g. resilience theory; see Stäuble 2014). As such, crumbling internal cohesion and broken networks, enhanced by increasing diversification, should be placed at the heart of this development. Reasoning from this, communities at village or cluster level may have responded differently to the developments taking place (cf. Modderman 1988, 130). As there were geographically and historically strong relational ties based on kinship and exchange between the Meuse clusters, adjacent Belgian sites, and the Rhineland, for which there is ample material evidence (e.g. De Grooth, this volume; Modderman 1988; Van Wijk *et al*. 2014b), the consequences of severing those ties may have been noticeable within generations. As old structures of contact and hierarchy were undermined (see Zimmermann *et al*. 2005), the more diverse reality that replaced them, with different and perhaps increasingly antagonistic identities in combination with a decreasing population, quickly led to societal collapse. Communities either had to move to survive, declined, or were integrated into new cultural developments.

For the Meuse clusters the emptying of the Rhineland may have been problematic with respect to resources and marriage partners. As argued by Zimmermann *et al.* (2005, 36), patrilocal residence rules and the innovations of the HST–GG sequence may have made it attractive for Rhineland women to marry into communities in Rhine-Hessen. Part of the Meuse clusters' communities may have followed their lead, while the remaining people suffered from the quantitative and qualitative decline.

To what extent this also affected the Belgian sites in the Hesbaye is not known, but between 5000–4900 cal BC (e.g. Jadin 2003; Meunier 2012), the BCQ–VSG complex also reached the Belgian clusters. Recent investigations increasingly demonstrate that they followed the Final LBK occupation there (see Blouet *et al*. 2013b; also see Ilett 2012; Meunier 2013). Any potential interaction between both groups (see Hauzeur 2011; Jadin 2003) was not intensive. It appears rather that interaction was avoided if LBK communities were still around. For the Meuse clusters this means that if there were still any LBK communities, they actively banned intensive interaction, or were perhaps integrated by moving into BCQ settlements. Eventually, the BCQ in this part of its distribution also ends around 4800 cal BC (cf. above). It may itself have been too thin on the ground to consolidate the developments that were initiated in the Paris Basin. Then everything appears to have gone silent. It was not until the re-occupation of the Aldenhovener Platte by communities attributed to the middle phase of the GG that the area again saw activity. As argued by Zimmermann *et al*. (2005, 40), the density in occupation was not comparable to the heyday of the LBK, and indeed renewed activity is only documented in the Meuse clusters (with the Rössen settlement at Maastricht–Randwijck), when population levels further east regain LBK volumes during the Later Rössen phases.

In this light, it may be proposed that, rather than facing an economic or territorial crisis or an epidemic, the rather sudden disappearance of the Dutch LBK relates to a number of mainly social and geographical factors. The necessary renewal or reinvention of Danubian culture took place in the Paris Basin and in the Upper Rhine area, the Meuse clusters are situated right in the centre, at the largest distance from both. Because of the diminished population levels and broken networks, it is plausible that any novelty only reached this area rather late and in a manner that considerably diverged from the known LBK template. When the “pincer movement” from the Rhine and Paris Basin reached Southern Limburg and adjacent Belgian territory, the LBK had either already vanished, or had simply refused to integrate new elements from elsewhere (Figs 14.1 and 14.2). Structuring principles were not altered over time and any new “actors” did not pass the stage of “acquaintance”. In conclusion, its combined social and geographical isolation eventually may be at the heart of the disappearance of the LBK in this area.

Conclusion: rebels without a cause

Sometime around the start of the fifth millennium a group of people gathered around a large pit at an LBK settlement that would later be known as Maastricht–Klinkers. The pit was situated close to the terrace edge and commanded a wide view over the Meuse valley. It was more than 1.20 m deep and was filled with stone tools, Hesbaye-type flint, and an enormous number of broken pots (approximately 291: Van Wijk *et al*. 2014a, 245). A number of vessels stood on its edge, some familiar, others with alien designs (Fig. 14.3). Although they came from as far away as Moravia, Rhine-Hessen, or the Pfalz, and must have been important tokens, they did not escape their fate. Smashed and broken, they ended up in the pit.

Although perhaps far-fetched, the extraordinary number and origin of the pottery in pit 1h at Maastricht–Klinkers (Van Wijk *et al*. 2014a) and the way it ended its life illustrate the changing times around 5000 cal BC. While elsewhere new innovations were able to change the LBK paradigm into a sustainable Middle Neolithic, the emblems of these developments still travelled the well-connected LBK network. They were, however, not received in the same manner everywhere and the same fate will have met the ideas and changes that underlay them. As argued by Modderman (1988, 130), "different solutions were chosen for problems that were not identical everywhere. One region may have kept much more of the old LPC [Linear Pottery culture] pattern than another". Reviewing the developments

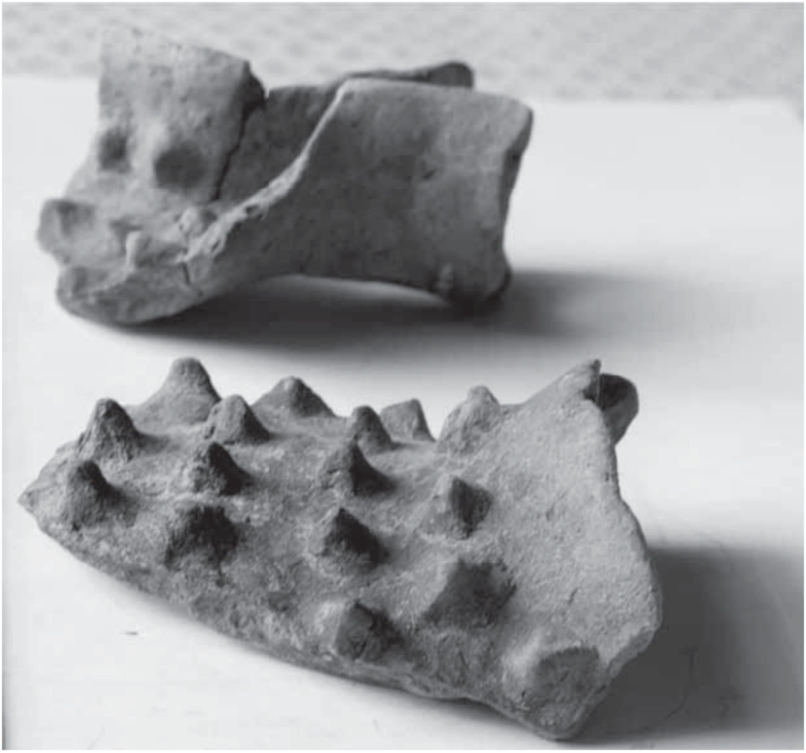

Fig. 14.3 Fragments of "exotic" pottery with "warts" from the large pit 1h at Maastricht–Klinkers (photo: P. van de Velde).

for the Dutch and adjacent Belgian LBK it may be argued that both social and geographical factors explain its ending. During the time of increased population density, its position at the edge of the loess in between other LBK clusters may have hampered expansion. The increasing diversity over time enabled the creation of a cluster- or even village-based identity, but at the same time undermined the interregional networks necessary for survival. People may simply never have heard what was going on in the Paris Basin, or what Hinkelstein was about. The subsequent implosion and decreasing numbers of households quickly reached critical levels. LBK communities were no longer sustainable in this area in any great number, and whatever change may have come was not integrated or understood. The remaining communities must have been isolated and were in a way rebels without a new cause. It could be argued that the LBK here was one of the final strongholds in north-western Europe, lasting until the very end. Burning out instead of fading into something new.

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Notes

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[1] For the second phase of distribution some scholars also argue in favour of a distinct role for the indigenous Mesolithic population and linkage through pre-existing networks (e.g. Cziesla 2008, 439; Robb and Miracle 2007, 111; Whittle 2003; 2007).

[2] The project was funded by a grant from the Netherlands Organization for Scientific Research (NWO) within the Odyssey programme and was aimed at analysing and synthesizing mostly unpublished data of old(er) excavations. Fourteen hitherto little-known LBK sites in the Graetheide cluster and near Maastricht were published, completing the picture of LBK settlement in this region.

[3] Chronologically the occupation of the Belgian Hainaut region and northern France may even be interpreted as a third phase of expansion (De Grooth and Van de Velde 2005, 238), associated with the Younger LBK or Modderman phase II (Modderman 1970). In general however, it is assumed to be part of the second phase.

[4] Recently a new terminology for the Paris Basin has been developed (Ilett and Meunier 2013; also see Blouet *et al.* 2013a). It basically presents a threefold subdivision in which the *Rubané moyen* replaced the old term *Rubané moyen Champenois* (RMC), *the Rubané récent* replaces the old term *Rubané récent champenois*, and the *Rubané final* replaces the old terms *Rubané recent du Bassin Parisien* (RRBP and RRBP final). Here I will use both terms as RF/RRBP.

[5] There has been a long-standing discussion regarding the contemporaneous or consecutive nature of BCQ–VSG and the Final LBK (e.g. Jeunesse 2001). There is currently no conclusive evidence for contemporaneity (Blouet *et al*. 2013b, 514).

[6] While Zimmermann *et al*. (2005, 38) argue that this indicates absence of any kin relation or continuity of previous rights and perhaps a sense of taboo, it may also point to an awareness of previous occupation and conscious avoidance because of a very deliberate break with the past.

[7] The development of BCQ from the RF/RRBP remains an important theme which has to address the strong stylistic diversity present in the RRBP (Ilett and Meunier 2013, 417). Much discussion here also has dealt with chronology, as based on Cardial influence the VSG was even interpreted as anterior to the RF/RRBP. Recent research using different sources, however, seems to confirm that VSG developed from the RF/RRBP (see Meunier 2012; 2013) and that there is little evidence for a prolonged coexistence of both (contra Jeunesse 2001; see Ilett 2010, 307). There are also strong indications that the LBK in the Hainault and Belgian Limburg may have influenced the birth of VSG and that in particular Limburg ware may have played an important role in this. It also underlines the strong ties with BCQ (see Meunier 2013, 486, 499).

[8] Van Wijk *et al*. (2014b, 497) argue that during phase 2d most settlements still appear to be inhabited and that there is even an increase in population density around Geleen and Stein. The overall number of households, however, rapidly decreases in 2d (Van Wijk, this volume) and around 4900 cal BC LBK occupation ceases.

BROADENING THE SCOPE

CHAPTER FIFTEEN

THROUGH THE LOOKING-GLASS, AND WHAT THE ARCHAEOLOGIST FOUND THERE: VARIABILITY IN THE BELL BEAKER PHENOMENON FROM A LBK POINT OF VIEW (OR THE OTHER WAY AROUND?)

MARC VANDER LINDEN

Introduction

Archaeological cultures are admirable scientific curiosities. Born out of the necessity to provide tools to integrate the ever-growing quantity of archaeological data available to the early generations of professional archaeologists, dismissed later on for the naivety underlying their interpretation as material markers of past ethnic groups, archaeological cultures have had a long, uneven fate within our discipline (Roberts and Vander Linden 2011). This tumultuous relationship has experienced a new phase over the past decade or so, with scores of researchers dedicating new methods and theories to the question at the core of archaeological cultures: how does material variability inform us about past people and behaviours?

It is not the place here to review the numerous answers to this question. Yet, and keeping in line with the focus on diversity underpinning this volume, it is worth spending a few theoretical lines on "variability", considered as a more neutral term. All too often, archaeologists have focused, generally as a matter of personal preference and/or expertise, upon a single category of evidence and—implicitly or not—subsumed the rest of the archaeological assemblage to this privileged trait. Even if several traits are considered, as in the classic Childean definition of an archaeological culture, homogeneity is assumed and all evidence is supposed to follow the same patterning. Both approaches are similar and intrinsically monothetic, and offer no room for variability *per se*. Clarke's well-known alternative, on the contrary, is polythetic, i.e. it considers the archaeological assemblage as a set of *a priori* independent variables, to be firstly analysed and understood in their own terms of reference, and secondly related to each other (Clarke 1968). In this sense, archaeological cultures become dynamic entities, of which spatial and temporal change are inherent features.

The present paper accordingly adopts a polythetic methodology by considering in a non-hierarchical way various categories of evidence, some traditional (pottery, settlement, and funerary practices), some less so (subsistence practices, Sr isotopes, and aDNA patterns). Although directly following on from earlier personal work (Vander Linden 2004; 2006), a slightly different approach is followed here, as the investigation is undertaken for two different archaeological cultures at the same time.

The challenge is attempted here for two iconic later prehistoric archaeological cultures in Europe: on the one hand, the Linearbandkeramik (hereafter LBK) and, on the other hand, the Bell Beaker (hereafter BB). Any shrewd reader will have noted that, at this stage, I refuse to christen any of them with a given label such as “culture”, “complex”, or—the dreadful yet fashionable alternative in certain circles—“phenomenon”. In many respects indeed, the purpose of this comparative exercise is to show that, when conducted over two cases, the polythetic analysis does not necessarily yield the same results: polythetic analysis not only unravels variability within archaeological cultures, but also across them. As the rest of the paper will show, this supplementary analytical level allows to characterize in a differential way the idiosyncrasies of each archaeological culture, and, in turn, opens further interpretative possibilities.

Although this contribution finds itself within a volume dedicated primarily to the LBK, its main documentary focus lies on the BB. This choice is reflected by a recurring imbalance throughout the paper, each section starting with a relatively short presentation of LBK data, followed by a longer descriptive appraisal of the BB.

Early clues: geographical and chronological background

There is no need here to present extensively the basic chronological and geographical characteristics of the LBK and BB. But, given the chosen comparative agenda, three points need to be briefly recalled.

Firstly, while the LBK and the BB owe their places in the pantheon of the great archaeological cultures to their spatial extent, their respective geographies are hardly identical. Indeed, the LBK extends mostly longitudinally, from the Paris Basin to Ukraine, so that, despite unquestionable ecological differences (e.g. gradual shift from a more Atlantic towards a continental climate, changes of forest cover: Hedges *et al*. 2013) the range of variability remains somewhat narrow. By contrast, the BB spread (Fig. 15.1) is not merely longitudinal, from the shores of the Irish Sea to the banks of the Danube in Budapest, but also, and essentially, latitudinal. Without even considering western Norway or Denmark, two regions which lie very late in the overall sequence, the presence of BB groups in the British Isles and Ireland, the Netherlands, southern Germany, and around the entire western Mediterranean basin implies a wide diversity of climates and ecologies. If the environmental setting of LBK and BB is thus markedly contrasted, their geographies still retain a common element of structure. In both cases, we are not dealing with continuous territories, but rather with strings of disconnected enclaves of varying extents. The reasons for this patterning are diverse and differ for each situation. Yet, for both cases, the implications are similar: for even a minimal level of uniformity to occur—and to be maintained—across these distinct geographical units, a certain flow—of goods, ideas, people—must have been in place. This theme is well-explored in LBK research parallel to an underlying narrative of uniformity (Bickle and Whittle 2013, 6–7, 20–22), but less so in BB studies (but see Vander Linden 2007), and will constitute one of the key arguments of the comparison offered here.

Secondly, there are obvious chronological differences between the LBK and the BB, disregarding the three thousand years which separate them. The LBK lasts six to seven centuries, from c. 5600 cal BC to c. 4900 cal BC, although the lifespan of several regional groups is much shorter (e.g. two centuries for the Rubané Récent du Bassin Parisien, from c. 5100/5050 cal BC to c. 4900 cal BC: Dubouloz 2003). More significantly, the LBK presents a clear spatio-temporal patterning. While the debate on the nature of its exact origins still rages, nobody questions that the LBK stems from the Hungarian basin, from which it expands in a two-stage process (e.g. Bocquet-Appel *et al*. 2008). By contrast, the BB is a shorter phenomenon lasting three to four centuries from 2600/2500 to 2300/2200 cal BC, although some local BB groups last well into the second millennium cal BC (cf. Epi-Maritime, Ciempozuelos, Danish group). The question of the BB homeland may underlie most of its historiography, but it remains—frustratingly to some—unresolved (Vander Linden 2013). Having considered the constraints imposed by the radiocarbon calibration curve, early dates in the Iberian Peninsula and the Netherlands indicate that the continental Atlantic façade was at the forefront of the changes, whilst Britain, Ireland, and central Europe were lagging. Yet, the make-up

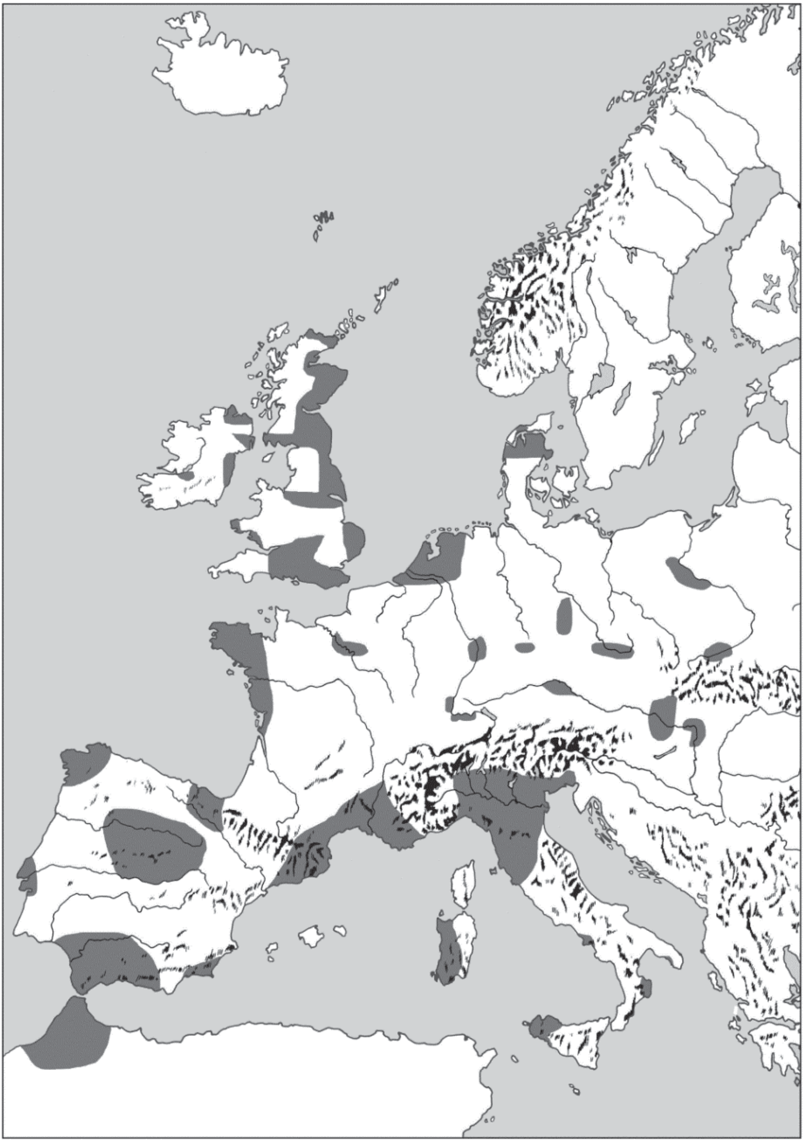

Fig. 15.1 The distribution of European Bell Beaker groups (adapted from Vander Linden 2006, fig. 1).

of the BB is much more than some loose core–periphery model, as several of its typological components present distinct spatial and temporal trajectories.

Thirdly, and perhaps more controversially, it seems that the LBK spreads in areas sparsely, if at all, populated. Regardless of the precise contribution of the late foragers to the emergence of the LBK, the forest cover, and associated relatively low ungulate biomass, could only support a relatively low human demographic density (Bocquet-Appel *et al*. 2012, 543). For Belgium and the southern Netherlands, Vanmontfort even suggests that the LBK preferably settled in areas of limited interest to, and therefore largely devoid of, foragers (Vanmontfort 2008; but see Crombé *et al*. 2009 and reply by Vanmontfort 2009). On the contrary, the diffusion of the BB happens in comparatively well-populated areas, across landscapes which had been farmed for up to three millennia.

Material expressions

The very idea of a LBK or BB archaeological culture rests first and foremost upon a certain appraisal of the material culture. Pottery, as ever, has been given primacy in these studies, but funerary practices and, especially for the LBK, architecture have also played prominent roles in the raging debates on diversity.

Pottery

It is not the place here to try to review the endless list of studies dedicated to LBK pottery. Suffice it to say that, in particular for the novice, this literature may be intimidating, with as many typologies as regional groups. For our purpose, it is noteworthy that such typologies generally rely upon a complex interplay of the attribute method and extensive seriations: although these have proved valuable tools to establish robust local typo-chronological frameworks, their wider comparative use remains relatively limited.

Other research, focused on the general organization of the decoration (so-called grammatical or systemic analysis: Houbre 2011; Jeunesse 2008; van Berg 1994), points to the existence of a continuous variation from one local decorative tradition to the next in the western LBK, all potters eventually resorting to the same set of rules. Incipient work on pottery technology also provides some interesting results, demonstrating the transfer and sharing of technological traits within and between LBK local groups (Gomart 2014).

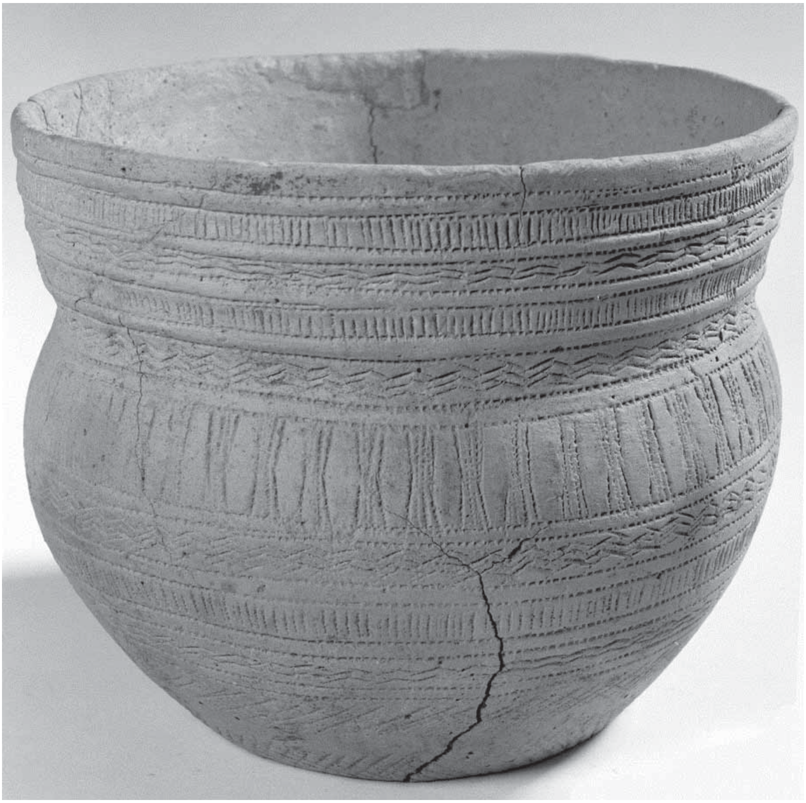

Fig. 15.2 A Veluvian bell beaker from the site of Ede-Ginkelse heide (photo RMO/National Museum of Antiquities).

Pottery is equally key in BB studies and, to a large extent, the historiography of BB interpretations parallels the fate of successive typo-chronologies. Often based upon ceramic decoration, most typological schemes tend to oppose early styles, which would be shared across several regions (e.g. so-called Maritime and All-Over-Corded), to later regional styles (see review in Salanova 2008). Recent dating projects and re-appraisals of the documentation have demonstrated the overall validity of this opposition, especially for north-western Europe (e.g. the Netherlands: Beckerman 2011/2012; northern France: Salanova *et al*. 2011), but have also established that regional styles start very early in the local sequences, generally within one or two generations. By contrast, around 2300–2200 cal BC, this process of regionalization reaches its natural end with the advent of clearly distinct ceramic styles and associated archaeological cultures (Wilkin and Vander Linden 2015). From a spatial point of view, BB ceramic decoration is generally organized in horizontal bands, with motifs being repeated from one band to the next using simple geometrical transformations such as symmetry or translation (Fig. 15.2). Based upon the way these rules are applied and later supplemented by various innovations, it is possible to delineate two or three large BB stylistic areas across the overall distribution area (Vander Linden 2004, 42–44). A roughly similar tale can be told for BB pottery morphology. In addition to the well-known S-shaped profile of the classical bell beaker, ceramic domestic repertoires present an interesting regional diversity (Besse 2003; Vander Linden 2004, 44–46). In central Europe for instance, assemblages comprise a mixture of new original forms, as well as types inherited from various older Late Neolithic cultures (Piguet and Besse 2008). As for the LBK, the relatively few existing assessments of BB pottery technology suggest that the regional diversity of decorative styles and morphological repertoires is criss-crossed by the movement of potters, possibly through intermarriage, and transfer of numerous technological traits from various stages of the *chaîne opératoire* (e.g. preference for oxidized clay: Querré and Convertini 1998; use of various types of shells for decoration: Drenth and Salanova 2012; Prieto Martínez and Salanova 2009).

Funerary practices

As for other archaeological cultures, funerary practices are often invoked in the definition of the LBK. Whilst the classical image of a LBK single crouched grave, containing various grave goods such as pottery, adzes and other stone tools, or ornaments and being part of a more or less extensive cemetery, does echo an undeniable archaeological reality, LBK funerary practices actually encompass a much wider range: regional preferences regarding body disposal and orientation (e.g. Jeunesse 1995, Van de Velde 1997), cremation (e.g. site of Aiterhofen: Bickle *et al.* 2011), graves found in settlements (Hofmann 2009), and instances of graves having been re-opened (e.g. site of Ensisheim–Les Octrois: Boës *et al.* 1998). Sometimes, this variation seems to present a geographical patterning, and Jeunesse for instance has identified two major geographic funerary traditions across the western half of the LBK, which he tentatively links to various levels of integration of local late foragers within the LBK koiné (Jeunesse 1995). An alternative, poietic approach to LBK funerary diversity has been advocated by Hofmann and Bickle, amongst others (Hofmann 2009; Hofmann and Bickle 2011; Oross and

Marton 2012). Drawing extensively upon Bourdieu's oeuvre (especially Bourdieu 1972), they have stressed that funerary practices should be seen as performances, enacted by individuals in ever-changing contexts. In this sense, whilst there might well be a loose set of rules across the LBK, this aspect is secondary to the way these were constantly re-enacted by local actors and communities. Yet, as pointed out by Bickle and Hofmann themselves, putting emphasis upon local action does not deter from raising the question of a relative homogeneity, although “the ways in which these ‘shared pools of resources’ could have been created are so far rather vague” (Hofmann and Bickle 2011, 196).

The BB situation is, at first sight, rather comparable with, on the one hand, a wide range of funerary practices especially regarding the treatment of the body (primary, secondary, individual, and collective burials, cremations...), and on the other hand, an apparent level of homogeneity expressed by the recurrent presence of bell beakers and various weapons in graves. Let us tackle the diversity first. It has become a cliché of BB studies to draw a north-west–south-east demarcation line across the BB distribution, stretching from Ireland to northern Italy. To the south, the funerary spectrum is dominated by collective burials in—mostly re-used—megalithic monuments, although individual burials are not rare (as in southern France, for instance Lemercier and Tchérémissinoff 2011). To the north, one finds the “typical” BB burial, with a single crouched body whose position is commonly dictated by bipolar gender-based rules. So, in central Europe, literally hundreds of burials follow the same pattern, with men lying on their left side, head to the north, and facing east, and women according to a mirror image, lying on their right side, head to the south, and also facing east. Elsewhere such cosmological rules are less absolute, as in the Netherlands (Beuker and Drenth 2005) or across Britain, where regional and temporal variation is observed (Clarke 1970, 455–456; Shepherd 2012). Further regional idiosyncrasies can be highlighted, as for instance mounds litter the landscape of the Netherlands and Britain, whilst flat cemeteries are dominant in central Europe (although notable exceptions can be found in both areas: e.g. flat graves amongst barrows in Heslerton, England: Powlesland 1986; mound of Maršovice–Jezeřany, Czech Republic: Langová and Rakovský 1981).

In contrast to this blurred picture, grave goods suggest, at first sight, a more unitary BB. Across all regions, bell beakers and weapons—or hunting apparatus (see Woodward and Hunter 2011)—such as flint and copper daggers, stone wrist-guards, and arrowheads are placed next to the remains of the dead. According to the 1970s processualist doctrine, together these would have formed a coherent package of prestige items, exchanged and shared amongst emergent elites as signs of their newly gained social power (Shennan 1976). However, it has since been demonstrated that in several regions this package does not have any real existence, as all its components are only encountered together in very few instances (Salanova 2007). More interestingly for our purpose, regional diversity can be observed for categories of grave goods. Following a long tradition, Bailly for instance recognizes a central European group, characterized by barbed arrowheads with a concave base, and an Atlantic group with the well-known barbed and tanged arrowhead, to which he adds a third group centred upon the Iberian peninsula, where lithic arrowheads are replaced by the so-called copper Palmela points (Bailly 2014). It must also be pointed out that barbed and tanged arrowheads are present in south-western Europe during the fourth and early third millennia cal BC amongst a wide range of arrowheads, but become an exclusive norm during the BB period (Dias-Meirinho 2011, 607).

Stone wrist-guards also present a marked regional diversity, reflected by the typological literature (see review in Dias-Meirinho 2011, 252–263). Technological studies provide us with some insights as to the structure of one particular local group. Work led by Woodward and Hunter has shown that the bulk of wrist-guards in Britain fall under three main geological categories (Group VI or Langdale bracers, amphibolite-rich bracers, and miscellaneous; Woodward and Hunter 2011). Most interestingly, it appears that these geological categories follow some chronological patterning, with red and black bracers, falling under the miscellaneous category, providing the earliest examples, whilst production of both Group VI and amphibolite bracers, both from locally available raw materials, starts a bit later. This suggests that, as soon as wrist-guards were introduced into Britain, local craftsmen assimilated them and initiated a production with a strong local identity.

As for bell beakers per se, the Maritime type is conspicuous in graves across Atlantic Europe during most of the sequence (Salanova 2007), but such vessels remain mostly absent in central Europe, where they seem to be replaced by handled jugs (Besse 2003). Assuming that both pottery types echo the role of social and ritual drinking (Rojo-Guerra *et al*. 2006; Sherratt 1987), the materiality of these practices changes noticeably across the BB world. This being said, if there is no ideal beaker or weapon to be identified throughout the entirety of the BB distribution, locally, strong conventions are at play as to what constitutes a suitable ceramic container or weapon to be deposited with the dead. These local preferences do not overlap perfectly, but the—already encountered—divide between a central European and an Atlantic sphere is worth pointing out.

Architecture

The most remarkable aspect of the LBK is without doubt the iconic rectangular longhouse. Its stereotyped form and structure, with its aligned central series of three posts, make it a frequent and immediately recognizable feature in any trial-trenching. In a way, the LBK house has become an implicit standard against which the rest of later European prehistory is measured, notwithstanding its impact upon regional architectural traditions (e.g. Paris Basin: Bickle 2013). Obviously, inter- and intra-regional diversity is recognizable, for instance in terms of length, orientation, architectural options, or wider village organization (Bickle and Whittle 2013, 7–9). Less numerous, but still widespread, enclosures are also a key component of LBK architecture. Several concentrations are observable, as in eastern Belgium and western Germany. In both regions, plans from distinct sites are so similar that they can actually be superimposed, a geographical and architectural proximity which has led several scholars to hypothesize the existence of itinerant architects or master builders (Bosquet *et al*. 2007; Saile and Posselt 2007; van Berg 1991).

By contrast, and for the first time in the course of the present comparative exercise, there is clearly no such thing as a BB architecture. Not only does it remain, despite decades of renewed attention and development-led fieldwork, the least documented facet of the BB, it is also the one where scarcely any patterning can be defined. In central Europe, settlements are generally only known through scatters of material culture, often located in river valleys (Turek *et al*. 2003). In the Mediterranean basin, BB architecture is marginally better documented, with the re-use of former types of dry-stone buildings in the Iberian Peninsula and southern France (e.g. Miradouro dos Capuchos, Portugal: Bubner 1981; Orgon, France: Barge 1986). Contrary to other groups, where the bulk of the information generally comes from graves, Danish BB finds mostly correspond to settlements of long rectangular houses with a sunken end (Sarauw 2007). These undoubtedly belong to a longer local building tradition (Boas 1991; 2000), but it is worth mentioning that, from a BB point of view, the Danish houses actually lie very late in the overall sequence, at a point where the BB has been taken over by other archaeological cultures in several regions. Whilst the evidence for BB domestic architecture in the Netherlands is sparse and debatable (Arnoldussen 2008, 171–174), the remains of oval buildings, frequently in stone masonry, have been identified in Britain, Ireland, and much of Atlantic France (Gibson 1987; Pailler *et al*. 2010). Yet, as for the Danish examples, several of these buildings date to the very last centuries of the third millennium cal BC and thus ought to be seen more as a local development than as a BB feature *per se*.

Subsistence techniques

The popularity of the LBK within archaeological circles does not only stem from its apparent lack of diversity, but also from its role in the introduction of plant and animal domesticates across much of Europe. It is therefore not surprising that much attention has recently been paid to identifying and characterizing LBK farming practices (e.g. most recently Saqalli *et al*. 2014). At first sight, the signal is highly comparable to material culture and dominated by apparent homogeneity, with underlying diversity. Plant assemblages witness a reduction in crop taxa diversity when compared to south-west Asian and south-east European assemblages, emmer and einkorn being given pre-eminence, whilst diversity mostly concerns secondary crops (Bickle and Whittle 2013, 11; Colledge *et al*. 2005). This drop also affects pulses, raising questions as to the origins of the protein supply in the diet (Bogaard *et al*. 2013). As pointed out by Bogaard and collaborators (Bogaard *et al*. 2013), one likely possibility is milk, consumption of which is directly attested in the LBK (Salque *et al*. 2013; see also Leonardi *et al*. 2012). Indeed, cattle dominate LBK zooarchaeological assemblages; their precise proportion tends to vary from one region to the next, as does the frequency of sheep and pigs (Bickle and Whittle 2013, 13–14).

For a long time out of reach given the overall lack of settlement evidence, there is now a growing body of data available regarding BB subsistence. Although the evidence remains patchy to say the least, it appears that there is no homogeneous BB farming system *per se*, perhaps not so surprisingly given its mostly latitudinal distribution. In the Florence area (Italy), stock breeding of cattle, sheep/goats, and pigs is well attested, whilst hunting is minimal (Corridi 2001). Data are scarce for the entire Iberian Peninsula, and excavations in the Meseta region have produced zooarchaeological assemblages dominated by sheep, then pigs and cattle, the latter with a high proportion of adult animals suggesting their use for milk production and/or traction (Morales and Liesau 1994). In Mediterranean France, one notes a very diverse situation from one micro-region to the next, which echoes the changing nature of the landscape (Vander Linden 2006, 83). All in all, the situation is a little bit better documented further north. For instance, the site of Engen–Welschingen “Guuhaslen” in the Hegau region close to Lake Constance has yielded the most extensive archaeobotanical assemblage in the entire BB distribution, with no less than 28,057 cereal remains (Lechterbeck *et al*. 2013). Threshing and further processing of cereals are attested (especially *Hordeum vulgare* and various types of *Triticum*), supplemented by the collection of wild plants. Interestingly, palynological analysis and settlement distribution show a change from the preceding Corded Ware period to the BB, marked by the abandonment of the Lake Constance shores in favour of the hinterland (Lechterbeck *et al*. 2013), a process also recognized in the French Jura from 2300 cal BC onwards (Voruz 1996). Across Britain, the BB period seems to correspond to a short episode of intensification of farming, as evidenced by the multiplicity of archaeological contexts which have provided cereal remains (Stevens and Fuller 2012). This agricultural change is also noticeable in pollen cores across Scotland and England, which show a drop of deciduous woodland cover during the second half of the third millennium cal BC (Woodbridge *et al*. 2014). It is also worth mentioning that the onset of farming in several parts of Norway is directly associated with a very late local BB group (Prescott 2009).

Demography

The interest in past demography is not new in archaeology (e.g. Hassan 1979), but this has been recently re-triggered thanks to the development of various scientific techniques which allow to peer directly into the structure of ancient populations. Whilst still in their infancy in many respects, these techniques have been applied to both LBK and BB contexts, allowing us to add a final, more original and yet crucial, trait to our comparison.

There have been long-standing assumptions about the demographic dimension of the spread of farming, and hence of the LBK; for instance, the "wave of advance" model presupposes a long-lasting population boom fuelling the expansion of farming practices (Ammerman and Cavalli-Sforza 1971; Fort 2009). Despite facing numerous criticisms, the existence of such a demographic boom has recently received strong support through the work of Jean-Pierre Bocquet-Appel (Bocquet-Appel 2008; from a LBK point of view: Dubouloz 2008; Zimmerman *et al*. 2009). If any precise estimate of the LBK meta-population remains a perilous exercise, much knowledge has recently been gained regarding the nature and structure of these human communities. The ability to examine directly the DNA preserved in archaeological bones has for instance allowed the testing of various hypotheses regarding the genetic affinities of the LBK populations. Because of its strong association with the introduction of farming practices, it had been long assumed that LBK origins eventually had to be sought in the Near East. This relationship was proven as several

LBK ancient mtDNA samples have demonstrated a high frequency of the N1a branch, absent from local Mesolithic hunter-gatherers, but frequent amongst modern-day individuals in the Near East and Anatolia (Bramanti *et al*. 2009; Haak *et al*. 2005; 2010). What came as a surprise is that this specific mtDNA branch is also rarely encountered amongst modern Europeans. Computer simulations indicate that it is impossible to directly link the LBK to modern European genetic variability, so that later, post-LBK major demographic events must have occurred (Ricaut *et al*. 2012; see below).

Another category of analysis widely applied to LBK samples over the past decade is strontium isotope analysis. As for aDNA, the results exceeded expectations as, throughout the LBK distribution, women recurrently show greater variance in $^{87}Sr/^{86}Sr$ ratios than men, indicating that more women had experienced relocation during their lifetime (Bentley *et al*. 2012). This patterning has been interpreted as the isotopic translation of a patrilocal kinship system. Furthermore, men buried with ground stone adzes yielded a narrower range of $^{87}Sr/^{86}Sr$ ratios than other men buried in the same cemetery, with values close to the expected range for loess soils. As Bentley and colleagues put it, this "suggests that, by the developed phase of the LBK, males buried with adzes had the most consistent access to preferred loess soils" (Bentley *et al*. 2012, 9329; see also Bentley 2013).

Albeit demography has been less of a focus in BB studies (but see Shennan 1993; Vander Linden 2012), over the past few years several publications have reignited an interest in the topic. Unsurprisingly given the long-standing role of migrations in the interpretation of the period, the BB has been, towards the late 1990s and early 2000s, a laboratory for Sr isotope research (Price *et al*. 1994; 2004; see Vander Linden 2007). For central Europe, Price and colleagues recorded that a large proportion of sampled individuals did not yield a local signal, indicating a marked difference between their place of birth and their place of death. Unfortunately, because of the complex geology, direct movements could not be retraced. Furthermore, contrary to the aforementioned LBK situation, no clear gender-based pattern was observed. Since then, other researchers have confirmed the existence of BB human mobility in Switzerland (Chiaradia *et al*. 2003), southern France (Boel 2011), and Britain (Evans *et al*. 2006; Fitzpatrick 2011), but in none of these cases has any age and/or gender patterning been recognized. Another difference with the LBK is that an example of very long-distance relocation has been recorded, albeit so far in only one case: the so-called Amesbury archer, a man lavishly buried within sight of Stonehenge, but thought to have been born in the vicinity of the Black Forest (Fitzpatrick 2011).

More recently, the BB has also made its appearance on the aDNA stage. At Kromsdorf, Thuringia, Lee and collaborators obtained mtDNA sequences for six individuals. Each belonged to a distinct haplogroup, suggesting that maternal lineages did not play any role in the constitution of this specific funerary group. It is also important to remark that none of these samples belonged to haplogroup H, which is the most frequent amongst modern European populations (Lee *et al*. 2012). By contrast, another recent study based on ten samples from six BB sites in Saxony-Anhalt has revealed a very high proportion of this haplogroup H, and also pointed to close genetic affinities with modern Iberian populations (Brotherton *et al*. 2013). This proximity is interpreted as the genetic expression of a BB migration from the Iberian Peninsula, blindingly reproducing an old classic BB tale (Vander Linden 2013). A similar result, and over-interpretation, was reached by Brandt and colleagues (2013) using a wider set of comparative material. It must be noted, however, that the results from Komsdorf were not included in this survey for methodological reasons (Brandt *et al*. 2013 supplementary material, p. 11). Two further studies must be quoted to finish this brief overview of the evidence. Firstly, aDNA sampling conducted on the site of El Mirador, a late third millennium cal BC site contemporary with the BB but lacking any BB material culture, has yielded a different signal to the Saxony-Anhalt samples, highlighting, if this was needed, the actual complexity of the genetic composition of third millennium BC populations (Gómez-Sánchez *et al*. 2014). Secondly, Patterson and colleagues have identified, in modern DNA, “a signal of gene flow from northern Europe into Spain around 2000 BC” (Patterson *et al*. 2012, 40). They tentatively link this to a secondary episode of BB migration from central Europe to Iberia, thus reviving the old—and widely decried—*Rückstrom* hypothesis put forward by Sangmeister in the 1960s (Sangmeister 1966).

Culture vs. phenomenon?

So, what did the archaeologist find in this game of mirrors? If one only takes into consideration the “traditional” categories of evidence, such as pottery, funerary practices, or architecture, the comparative approach adopted here at first sight does not seem to fulfil its suggested potential. In both cases, various traits point towards either homogeneity or diversity, and based upon one's preferred scale of investigation it is easy to see how the interpretative balance can swing either way. Pottery provides a good example of such similarities between the LBK and the BB: decorative styles are characterized by large distributions and widely shared organizational rules, whilst technological studies point to the maintenance of these coherent units through the continuous—but probably limited—movement of individuals. The same conclusion can be reached for LBK architecture, as pointed out especially for the similarities of enclosures in the north-west part of its domain. In contrast, a BB architecture *per se* does not exist, partly due to the poor documentation, but mostly given the overall diversity, with only varied, local traditions in Denmark and, perhaps, across the Atlantic façade. Funerary evidence gives yet another picture. On the one hand, there is a clear range of known LBK practices operating within a loosely bounded set of rules (but see Sommer 2001). On the other hand, whilst the range of BB funerary treatments is definitely wider, this apparent diversity is superseded by the recursive inclusion of certain categories of grave goods, universally accepted throughout the BB domain and materialized in preferred local forms.

The addition of "non-traditional" traits allows us to sharpen this otherwise blurry picture. The LBK is famously associated with the inception of farming practices across Europe. This diffusion process operates, geographically speaking, along a longitudinal axis and sees little variation in terms of agriculture and stock breeding. In comparison, the BB latitudinal distribution implies its spread across a multiplicity of ecological zones, reflected by the range of recorded agricultural regimes, sometimes associated with a certain degree of intensification, as in Britain. The last trait reviewed here also proves the most compelling. Old and not so old theories on both the LBK and the BB have often had views on migration at their core and, in this sense, the ability to peer directly into population structure, provided by archaeological science, proves to be essential. The LBK not only corresponds to a clear demographic push, linked to the onset of farming, but also to a distinctive DNA signal, demonstrating clear Near Eastern connections and differences with local foraging populations, but it ultimately has little or no impact on the genetic make-up of modern European populations. This genetic identity is paralleled by a strong patterning in terms of human mobility, unmatched so far in later European prehistory. In contrast, the BB is fuzzier: it might be linked with a period of massive re-organization of European DNA variability, but the jury is still out as to the geographical and historical structure of this process. Pioneering strontium studies also demonstrate extensive mobility, especially in terms of the longer distance, but the lack of any gender patterning is striking.

If indeed variability appears as a key facet for both LBK and BB, the comparative approach adopted here sheds some light on the intrinsic differences between both. Arguably spatial and temporal diversity occurs, but the LBK still appears as a relatively homogeneous entity, partly explained by its geographical expansion in a territory sparsely populated by small-scale, dispersed, and mobile communities. Not that the aforementioned genetic identity warrants to resuscitate the idea of "LBK people", but the range of variability described here, reinforced by the congruent indications of human mobility, indicates that the LBK is not so distant from the classical definition of an archaeological culture. By comparison, the BB appears more as a series of geographical blocks, each with their own idiosyncrasies, but still linked together through accepted common traits, particularly salient in the funerary realm, and the—potentially extensive—flow of individuals. Together these two elements ensure a given level, if not of cohesion, at least of coherence in the BB as a whole. In this sense, the BB is indeed more phenomenon than culture, although the active role of moving individuals, rather than disembodied ideas, should not be overlooked.

An altogether too brief conclusion

In the context of this paper, I explicitly do not wish to pursue further the interpretations, or identifications, of the past realities encompassed by the LBK and the BB. In each case, the task largely remains to be undertaken. Arguably, new evidence will help, be this new excavations or further refinements in the field of archaeological science. This being said, improvement is first and foremost needed at the level of our methodological and conceptual toolkits. As the historiography of archaeological cultures shows, variability has been a key concern for generations of archaeologists. And yet, as the present comparative assessment of material culture shows, we are still lacking the basic tools to describe and assess variability in archaeological data, and by extension interpret it (see also Shennan 2013). In many respects, we are paying the price of a long-standing theoretical and methodological complacency, lured as our discipline has been by seeking immediate answers in neighbouring disciplines. Despite having been written more than 45 years ago, we still have not come to terms with Clarke's famous statement that "archaeology is archaeology is archaeology" (Clarke 1968, 13). It might not be enough for some, but given how difficult and exciting it is, it is fine by me.

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CHAPTER SIXTEEN

UNIFORMITY AND DIVERSITY IN THE LATER NEOLITHIC OF THE MIDDLE EAST

ALEXANDRA FLETCHER

Introduction

The Late Neolithic period in the Middle East region is associated with important long-term social changes from village-based agricultural subsistence towards stratified, urbanized societies. The period arguably offers a significant opportunity to assess social developments of increasing complexity and the very earliest origins of urbanism (Campbell *et al.* 1999, 395–396). This, however, has not been comprehensively addressed within archaeology to date. Instead, a great deal of focus has been placed either on the origins of agriculture or on early urbanization with little work to examine how social groups moved from living in small-scale village communities to eventually becoming large-scale urban populations. Central to this topic is the so-called Halaf period (c. 6000–5200 BC), significant because this period is associated with the earliest large-scale inter-regional communication identified through similarities in material culture (LeBlanc and Watson 1973). Although symbolic parallels can be discerned over wide areas of the Middle East prior to the Late Neolithic (Sherratt 1995; Watkins 2010), before the Halaf period there remained a marked variation in local meanings and style and the connections that existed were looser and more fluid (see responses to Hodder and Meskell 2011). In contrast, during the Halaf period, close similarities in material culture can be seen across settlements from northern Mesopotamia to the Zagros, Djebel Hamrin and the Tigris, to the Syrian Jezirah, Van and Keban regions of Turkey, and Syro-Cilicia (Akkermans 1993, 5) (Fig. 16.1). This marked degree of cultural uniformity, despite the large distances involved, prompted the concept of the "Halaf" as a cultural entity (Campbell 1997, 39). This paper will discuss how the perception of uniformity in the Halaf was created and then replaced by a greater appreciation of diversity in material culture during this period. It will then use a case study drawn from the Halaf site of Domuztepe to discuss how cultural practices can be indicative of both uniformity and diversity and why this is significant for studies of social complexity.

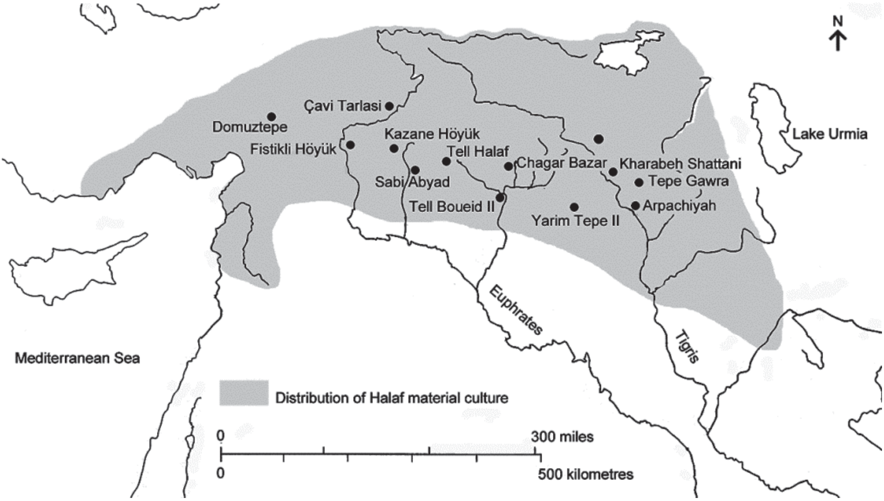

Fig 16.1 Map showing sites named in the text and the geographic area where Halaf material culture has been found.

Uniformity in the Halaf

Early approaches to the study of the Halaf period assumed that artefacts were the direct expression of cultures that were also an acknowledged reality in the past (Johnson 1999, 16–17). For researchers working in the early and mid-twentieth century, chronology and culture were so closely connected that the Halaf was established as both a chronological and geographical entity. The fundamental belief in culture as a past reality meant that type sites were used to frame analytical approaches to the investigation of the past. The eponymous site for the Halaf period was therefore Tell Halaf itself (von Oppenheim 1943). All the Neolithic material recovered by von Oppenheim during his excavations had been redeposited however, so the site of Arpachiyah, located near Mosul in north Iraq, was the first site where stratified Halafian deposits were excavated in 1933 (Mallowan and Rose 1935). The absence of other stratigraphically ordered material and the remarkable preservation through the action of fire seen in the last Halaf level at the site (TT6) meant that the material excavated from Arpachiyah became the accepted source of data to define the culture and chronology of the Halaf period.

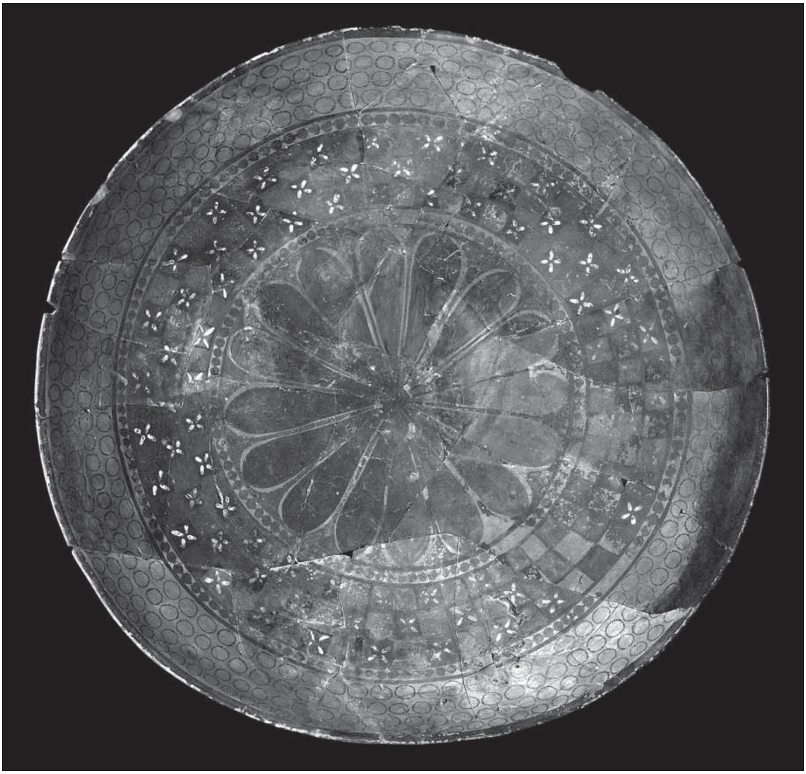

Fig 16.2 Fine painted ceramics with fabric colours ranging from orange through pink are characteristic of Halaf material culture. Particularly fine examples, such as this bowl from Arpachiyah, north Iraq, were decorated with black, red, and white paint. Diameter 28 cm, depth 7 cm. Copyright: Trustees of the British Museum, ME 127507.

The suite of material culture traits that are therefore traditionally termed Halaf are characterized by fine, painted ceramics with fabric colours ranging from orange through to pink, circular dwellings known as *tholoi*, stamp seals, and female figurines (Breniquet 1989, 325; Castro Gessner 2013, 125). These characteristics have been associated with the Halaf period precisely because they were all found at Arpachiyah (Figs

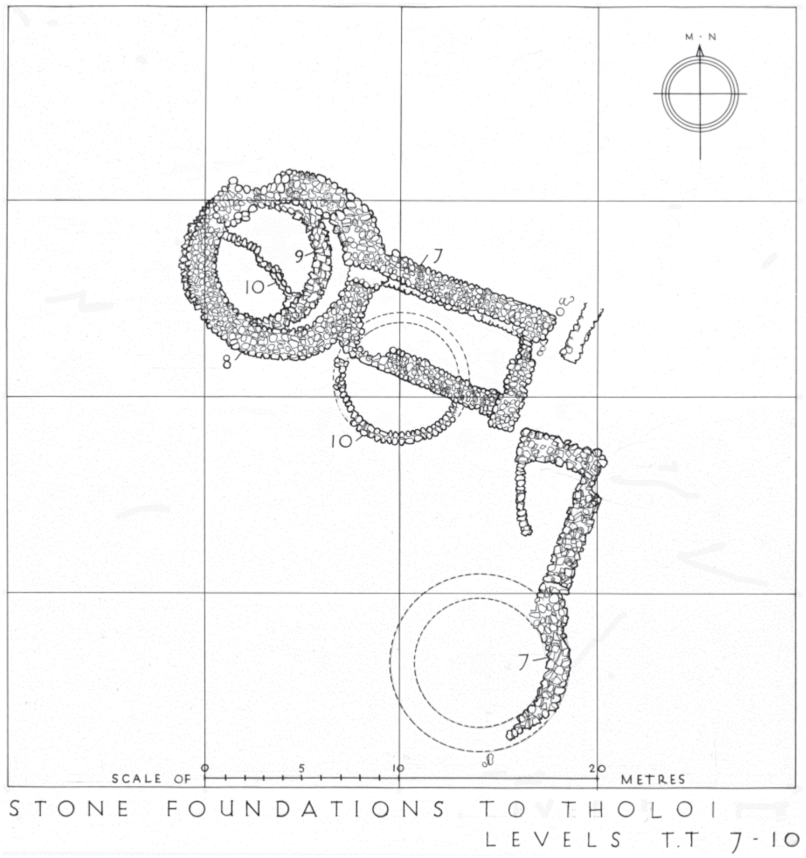

Fig 16.3 Plan of levels TT-7-10 at Arpachiyah showing circular dwellings known as tholoi. These were once regarded as the typical Halaf building form. Drawn by J. Cruickshank Rose. Excavation archives of the Middle East Department, British Museum. Copyright: Trustees of the British Museum.

16.2–16.5). The creation of these Halaf "signifiers" also contributed to the division of northern Mesopotamia into a Halaf "heartland" in north Iraq and peripheral zones to the west of the Euphrates river based on variations in quality of pottery fabrics and paint lustre (Braidwood and Braidwood 1960). Another crucial generalization was the association of the Halaf period with low social complexity (Davidson 1981; Davidson and Mc Kerrell 1976; 1980; Leblanc and Watson 1973). Small site sizes (typically 5 ha), a dispersed settlement pattern, low incidence of status indicators, absence of craft specialization, and absence of public institutions have all been cited as evidence for limited social development during this period (Akkermans 1993, 289–292, 321–323). The assumed dominance of mono-cellular *tholoi* was compared with ethnographic examples in order to suggest that settlement structures were indicative of low social stratification based around extended families (Breniquet 1996, 92–94; Forest 1996, 27–35). Rectilinear, multi-cellular buildings, regarded as indicators of greater social complexity (Flannery 1972, 29–49), were considered to be virtually absent.

An important focus for research therefore became how the Halaf "package" of material culture was able to spread across the northern Fertile Crescent. Research frameworks attempted to explain this change in terms of itinerant potters (Dabbagh 1966, 24), nomadic movements (Amiet 1981, 73; Cauvin 1985, 189–192), trade in resources and exotic materials (Campbell 1992a, 137–157; 1992b, 184–187; Merpert and Munchaev 1993a, 145–152), the movement of women in matrimonial exchange (Breniquet 1987, 236), pottery trade (Davidson 1981; Davidson and Mc Kerrell 1976; 1980; Le Mière and Picon 1987), and evolutionary acculturation based on technological differences between social groups (Breniquet 1987; 1989; 1996). None of these theories can be singled out

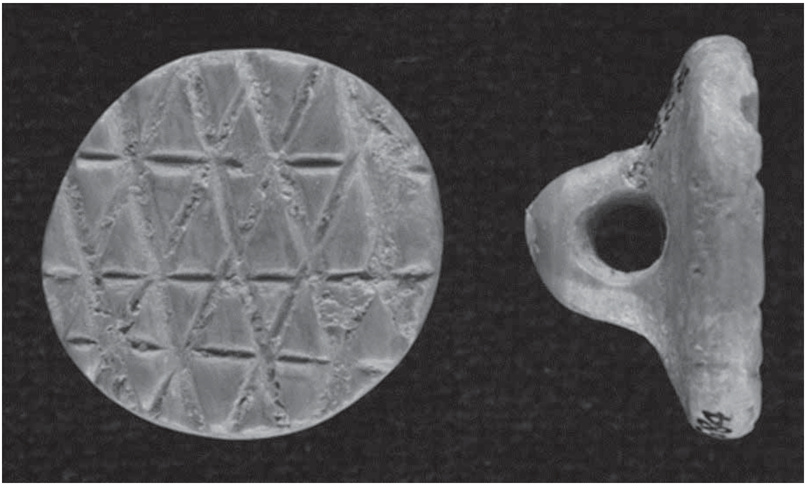

Fig 16.4 Marble stamp-seal from Arpachiyah. Stamp-seals engraved with geometric designs were regarded as a characteristic Halaf material culture trait. Diameter 1.75 cm, height 1 cm. Copyright: Trustees of the British Museum, ME 127684.

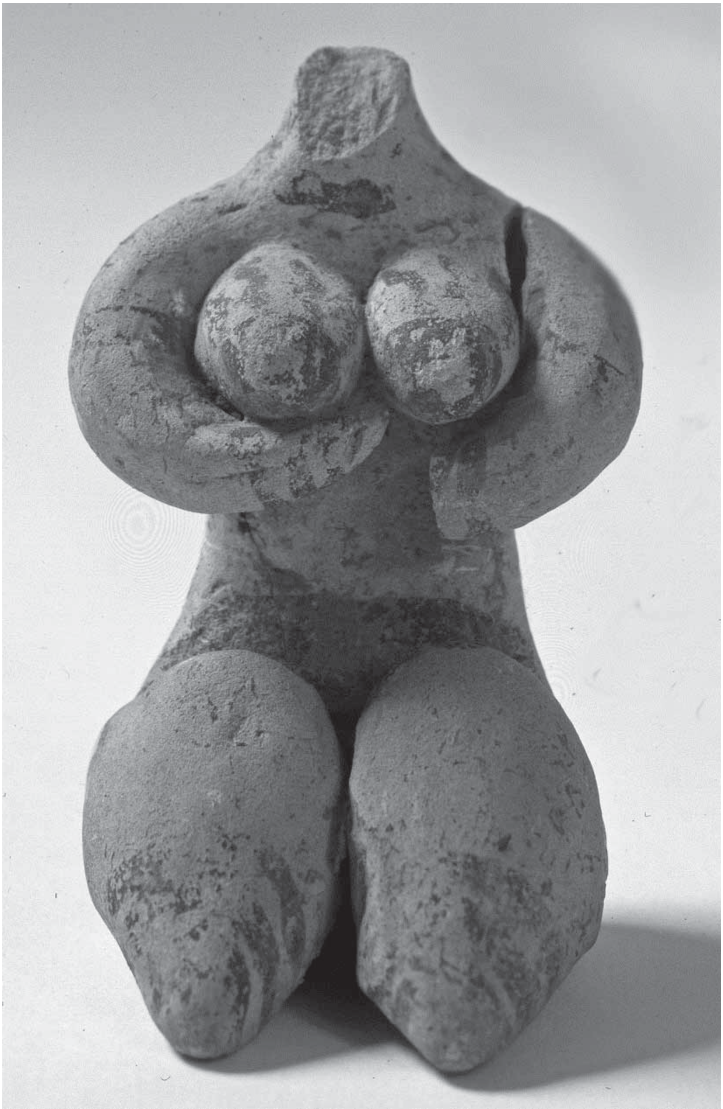

Fig 16.5 Painted pottery female figurine from Chagar Bazar, north Syria. Similar rotund, female figures were found across the northern Fertile Crescent and thereby became part of the suite of “Halaf” characteristics. Height 7.5 cm, width 4.5 cm. Copyright: Trustees of the British Museum, ME 125381.

to explain how such a widespread and relatively rapid adoption of material culture occurred towards the end of the seventh millennium, although all of the aspects identified may have played a part. Physical relocation, either of people or traded artefacts for example, does not appear to be of sufficient geographic scale to account for the Halaf phenomenon (Spataro and Fletcher 2010). Interestingly, the great variety of burial practices identified as dating from the Halaf period made it difficult to form broad interpretative generalizations regarding mortuary treatments and this remained an area where diversity in the Halaf was acknowledged (Akkermans 1989). Despite research at sites such as Kharabeh Shattani and Çavi Tarlası (Baird *et al*. 1995; von Wickede 1984; von Wickede and Herbordt 1988; von Wickede and Mısır 1985; Watkins 1987; Watkins and Campbell 1986) ideas established by Mallowan's work at Arpachiyah regarding the Halaf culture and social structure lingered into the 1990s with remarkable tenacity (see Watson and LeBlanc 1990, 134–139). At this point however, the question of the Halaf as a cultural entity became a subject of fresh debate in Middle Eastern archaeology. As work in the so-called Halaf "heartland" of northern Iraq was severely restricted following the Iraqi invasion of Kuwait in 1991, sites outside Iraq were examined, such as Takyan Höyük, Kazane, Fıstıklı Höyük, Tell Sabi Abyad, Tell Boueid, and Domuztepe (Algaze *et al*. 1991; Bernbeck *et al*. 1999; Bernbeck and Pollock 2003; Campbell *et al*. 1999; Nieuwenhuyse 2007). These fuelled existing challenges to the concept of uniformity in the Halaf by adding new data to the debate.

Diversity

Re-assessment of the chronological structure of the Halaf period (Campbell 1992a, 182; 2007; Watkins and Campbell 1987) helped to undermine Mallowan's assertion that the ceramics at Arpachiyah represented the highest technical achievements of the closing phases of the Halaf period. Ceramic studies also revealed that the division between heartland and periphery was oversimplified and that the slightly finer pottery tradition of the "heartland" was the exception rather than the norm (Campbell 1999, 575–576). Studies at sites such as Tell Sabi Abyad also demonstrated that the Halaf in both the east and west probably evolved out of the same Samarran painted pottery tradition (Nieuwenhuyse 2007). Re-examination of settlement data also showed that sites such as Arpachiyah and Yarim Tepe II actually show a mixture of rectangular and circular architecture (Akkermans 2010, 22; Hijjara 1978, 126–127; Merpert and Munchaev 1993a, 131, 137–139; Munchaev and Merpert 1973, 9). Hence, the existence of circular buildings in the Halaf did not exclude other architectural styles and the direct association between *tholoi* and low social complexity was an oversimplification. Further assessment of the history of excavation was also able to demonstrate the dominance of type sites in skewing research towards approaches based on the artificial projection of uniformity across different data sets, chronological periods, and geographical regions (Campbell 1999; Campbell and Fletcher 2010).

Domuztepe is a good example of a recognizably "Halaf" settlement which nevertheless deviates significantly from the prescribed characteristics of a Halaf site. Excavations (1995–2011) encountered deposits dating from the Late Ceramic Neolithic (c. 6250 cal BC) to the Late Halaf period (c. 5400 cal BC) (Campbell *et al*. 1999; Carter *et al*. 2003). The settlement is not located in northern Iraq, but rather at the western limit of where Halaf pottery is found in south-central Turkey (Fig. 16.1). Surface survey and discriminant analysis of the pottery collected during that survey showed that by 5500 cal BC almost the entire site was occupied, making the inhabited area (20 ha) considerably larger than the generally accepted norm for a Halaf site (c. 5 ha) (Campbell *et al*. 1999, 400). This suggested that more than 2000 people could have lived in Neolithic Domuztepe at one time; something that has significant implications when compared to studies of settlement fission (Bandy 2004; 2010). The sites of Takyan Höyük and Kazane could also have had similar levels of occupation (Algaze *et al*. 1991; Bernbeck *et al*. 1999). The identification of intra-site stylistic and functional zoning (Fletcher 2008; Gearey *et al*. 2011, 478) and limited craft specialization (Carter *et al*. 2003, 128–133) despite the apparent absence of hierarchical social structures (Campbell 2007/2008; Campbell *et al.* 1999, 417; Kansa *et al.* 2009a) has challenged ideas concerning the uniformity of the "Halaf package". Therefore, recent interpretations of the Halaf period are questioning the "classic" suite of attributes proposed following the excavation of Arpachiyah and thereby the assumption that social complexity does not begin to emerge until the latter half of the Ubaid period (c. 4500 cal BC) (Nieuwenhuyse *et al*. 2013).

With the fresh perspective that recent excavations have afforded, archaeologists have returned to the question of the Halaf as a cultural entity and re-examined its emergence within the archaeological record. As the concept of a uniform Halaf material culture has been so appealing, challenges to this idea are still relatively recent (Campbell 1999; 2000; Nieuwenhuyse 2007). This begs the question: what defines and shapes the current concept of what the "Halaf" is? A strong case has been made that a key factor in the development of the "Halaf" known to archaeologists is the circulation of painted pottery at the end of the seventh millennium (Nieuwenhuyse 2007). Other characteristics appear at best sporadically and with more variation, but the pottery is a key factor in terms of site classification (Le Mière 2013, 328). Within the pottery evidence itself however, both regional diversity and uniformity have been advocated at inter-regional, inter-site, and even intra-site levels of analysis (Campbell 1992a; Castro Gessner 2013; Davidson 1977; Fletcher 2008; Hole 2013; Irving 2001; Le Mière 2013; Perkins 1949, 43–45; Spataro and Fletcher 2010).

Halaf networks

Studies of the Halaf period have gradually moved away from working within a framework defined by a specific set of material culture attributes and researchers have begun to look at different explanations for the network of connections that have been identified between sites. Although the movement of people (nomads, spouses, traders, potters) probably played a part in creating the distributions of material culture discerned by archaeologists, other aspects of inter-societal interaction may have been more significant in creating such widespread changes in material culture (e.g. Bernbeck 2013; Frangipane 2013; Nieuwenhuyse 2013). Studies examining the emulation of material culture within social contexts such as feasting offer insights towards how established networks of communication may be reflected in the archaeological record. Population groups appear to exist in a constant state of acculturation via external and internal changes and fuelled by rivalry and competition (Leroi-Gourhan 1973; Miller 1982, 89; 1985; Moore 1987, 103–104; Renfrew 1986). Material culture is therefore manipulated and emulated by different groups as they interact, ultimately resulting in the adoption of modified stylistic traits (Barnett *et al*. 1954, 980–985; McGuire and Paynter 1991). Feasting too, creates an opportunity for groups or individuals to manipulate their relative status and establish a variety of reciprocal debts, but feasts also promote solidarity and communality and therefore may have helped to suppress incipient hierarchy and promote the idea of egalitarianism (Hayden 2001; Potter 2000, 471–475, 487; Wright 2004a; 2004b, 133–137).

It has therefore been suggested that the widespread changes in ceramic style coupled with an apparent lack of formalized social ranking in the Halaf period were related to the emulation of decorated vessels encountered during feasting, which was simultaneously connected both to the maintenance of existing inequalities and to the promotion of the idea of egalitarianism. In other words, the use of pottery vessels during feasting was a source of stimulation for stylistic change. In turn, this potentially inverts traditional explanations for the spread of Halaf painted ceramics over a wide geographical area, as perhaps trade in exotic materials happened because of patterns of feasting, and not vice versa (Nieuwenhuyse 2007, 219–226; 2009; 2013). Most importantly for the study of the Halaf period, the widespread adoption of painted pottery discernible across the northern Fertile Crescent could reflect the spread of socially-driven activities that were inherently contradictory, being both divisive and unifying in character.

Halaf feasting

Nieuwenhuyse's work is an important departure from earlier theories accounting for the existence of the Halaf phenomenon precisely because it suggests a plausible context for material culture transfer that occurs widely across society for many different social reasons in different situations (Dietler and Hayden 2001). In addition to Nieuwenhuyse's studies of Tell Sabi Abyad and Tell Boueid II, the excavations at Domuztepe presented interesting opportunities to examine this theory because feasting appears to have been an important component in the creation, use, and maintenance of two of the structures, a large long-lived earthwork (the Red Terrace) and a multiple burial (the Death Pit) (Fletcher and Campbell 2015; Kansa *et al*. 2009a). The Red Terrace was a linear earthwork aligned east–west, consisting of a 20 m wide raised bank constructed using clean *terra rossa* clays, brought to the site from hills lying to the west (Campbell 2004, 4–5; 2005, 14; Carter *et al*. 2003, 118–119, fig. 6; Gearey *et al*. 2011).

The structure was at least 75 m long and was repeatedly maintained and stabilized over a considerable period of time (c. 6100–5500 cal BC). Large ovens have been found across the excavated area and an interlinked series of segmented scoops and pits (the Ditch) run for at least 25 m alongside it. The scoops were repeatedly recut, and were densely filled with large quantities of material culture debris. In contrast, the bank is notably devoid of artefacts. In the Ditch, animal bones, particularly of young sheep and goats, were plentiful and possibly represent waste from feasting within relatively small familial or kinship groups (Kansa *et al*. 2009b, 911). The ovens may be indicative of cooking associated with this feasting. Ceramics were found in large numbers, especially robust vessels with globular bodies and long necks that may have been associated with the use of liquids (Irving 2001, 229–232). Processing of dairy products may also be indirectly linked with the production and consumption of alcoholic drinks (Nieuwenhuyse 2007, 225) and analyses of vessels from the Ditch at Domuztepe have recovered such deposits (Evershed *et al*. 2008).

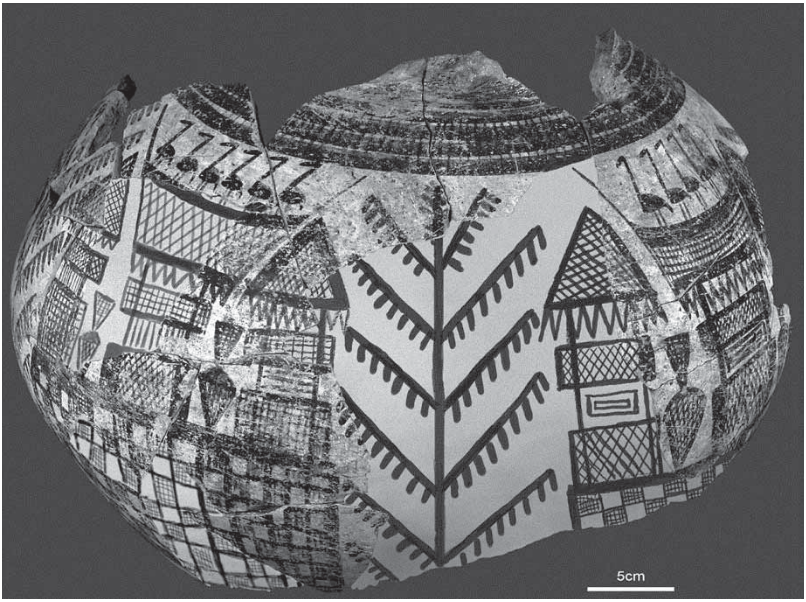

Fig. 16.6 Reconstructed view of a painted vessel of a type frequently found in the Ditch pottery assemblage. A building is depicted with birds, possibly storks, standing on the roof. Copyright: Domuztepe Excavation project, Stuart Campbell.

Other potsherds possibly indicate that the area was used seasonally. Particularly notable in this respect were significant numbers of painted sherds depicting a two-storey building. The depiction of storks on the ridge of the roof has been interpreted to represent a specific time of year, probably during the nesting season (Gearey *et al*. 2011, 477) (Fig. 16.6). All these factors, the recutting of scoops within the Ditch, the juvenile animal bones, and the images depicted on the pottery, point to relatively small kin groups participating in feasts on the Red Terrace as part of a repeating cycle of events (Gearey *et al*. 2011, 477–478; Hayden 2001, 47–58). The recurrence of the house image on pottery from other sites, such as Sabi Abyad (Nieuwenhuyse 2007, 10, tab. 1.2.1, 20, fig. 2.2.4), Fıstıklı Höyük (Bernbeck and Pollock 2003, fig. 22g), and Arpachiyah (Breniquet 1992; Hijjara 1978) further implies such activities and associations were not limited to Domuztepe alone, but may have been part of a much wider network of social behaviours (Campbell and Fletcher 2013; Costello 2013). Other evidence suggestive of wider networks of behaviour takes the form of several notched animal scapulae from the site, which are possible candidates for being feasting tallies (Hayden 2001, 45). Although other uses are possible, their presence potentially suggests there were systems of reciprocity or notation for commensal events. Feasting may well therefore have provided regular opportunities for behaviours and material culture to be communicated and copied both within and between communities.

The Death Pit (c. 5586–5566 cal BC) was dug into the southern edge of the Red Terrace and possibly derived greater significance through such co-location (Campbell 2007/2008) (Fig. 16.7). This burial was a multiple inhumation of at least 40 disarticulated individuals, mixed with animal bone and other cultural debris. A significant layer of ash was spread over the top of the buried individuals. The ash had been brought to the Pit from elsewhere, as there were no signs of *in situ* burning (Campbell and Healey 2011, 328; Carter *et al*. 2003; Kansa *et al*. 2009a). The burial was constructed over a relatively short time and then marked by two large posts. Subsequently, further human remains were buried around its edges (Campbell and Healey 2011; Kansa *et al*. 2009a). The Death Pit therefore remained a focus for the community long after its initial creation.

A large feast appears to have been part of the activities connected with the Death Pit's creation, as quantities of cattle bone, representing a minimum of about eight prime-age female animals, form one of the lower layers within the deposit. The bones were largely the meat-bearing parts of the carcass with a low proportion of butchery debris. A similar deposit, also relating to cattle bone, has also been found to the north of the site. The amount of meat derived from the bone in the Death Pit would have been sufficient to feed around 2000 people, potentially the whole settlement. These cattle were a valuable resource; they were prime-age females which had required substantial resources to keep to maturity and would arguably have had a continuing long-term worth as a source of milk and breeding stock (Campbell *et al.* 1999, 401; Kansa and Campbell 2002; Kansa *et al*. 2009a; 2009b, 911–912). This is the opposite situation to Çatalhöyük, where wild bulls appear to have been preferentially selected for feasts (Hodder and Meskell 2011, 237, 243; Russell and Martin 2005), but accords with the trend for females to outweigh males in the animal bone assemblage once domesticated cattle have been introduced (Peters *et al*. 2013). In terms of quantity, the large-scale, high-prestige cattle feast or feasts suggested by the deposits in the Death Pit is different from the consumption represented by the animal bone in the Ditch, where seasonal repetition may have encouraged the consumption of meats with lower value or prestige. The young sheep and goats would not have required the same investment of time and resources as the cattle in the Death Pit, nor would their deaths have prevented the production of more animals.

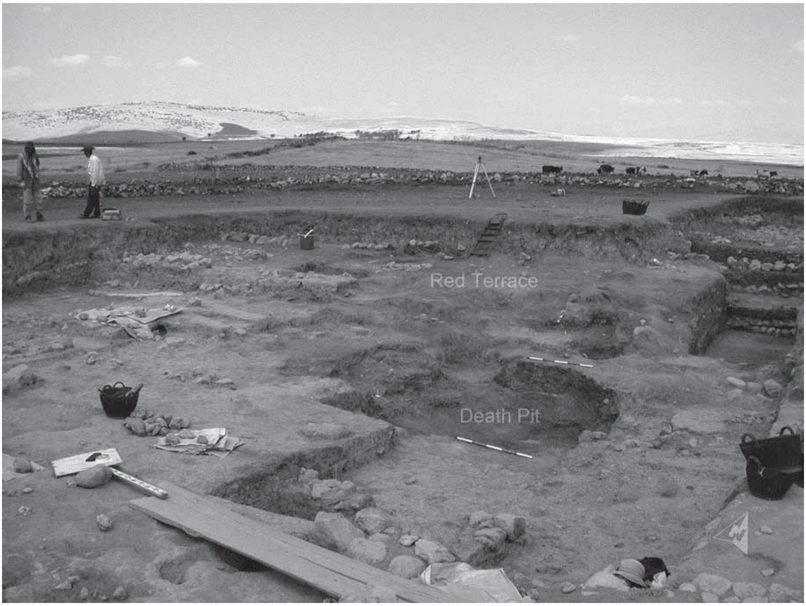

Fig 16.7 Photograph showing relative positions of the Red Terrace and Death Pit during excavation. Copyright: Domuztepe Excavation project, Stuart Campbell.

To add to the drama of this community-wide feast, there are also human remains within the Pit which themselves also show signs of consumption. The human bone assemblage was highly fragmented, heated, and processed in a manner that was strikingly similar to the animal bone. Violent death and sacrifice are plausible explanations for the state of this bone assemblage and there is also a strong possibility that cannibalism may have taken place (Carter *et al*. 2003; Kansa *et al*. 2009a). Such consumption may have been highly symbolic and the physical location of the Death Pit may have become a place where social relationships were expressed through acts of consumption and disposal, part of the way in which cultural capital is created, expressed, and maintained (Campbell 2007/2008; Goldman 1999; Lindenbaum 2004; Sartore 1994; and see McOmish 1996, 75; Pollard 2001; Thomas 1999; Ullén 1994).

As mentioned above, no particular burial practice has been singled out as the "norm" for the Halaf period, making it difficult to suggest whether the Death Pit was as highly unusual within Halaf society as it appears from a modern viewpoint. Mass burials known from Tepe Gawra and disarticulated burials from Arpachiyah and Yarim Tepe II only appear loosely related, but similarities can be identified between the Death Pit and burnt deposits, both objects and humans, at Arpachiyah, Yarim Tepe II, and Chagar Bazar (Campbell 1992a, 176–183; Campbell *et al.* 1999, 403–404; Hijjara 1978; Mallowan 1936; Merpert and Munchaev 1993b; Tobler 1950). As suggested for the imagery of houses painted on the pottery recovered from the Ditch, the treatment of the bodies and use of ash within the Death Pit therefore may draw on widespread ritual elements, and beliefs, from across northern Mesopotamia (Campbell and Fletcher 2013; Frangipane 2013). The Halaf therefore may not have been culturally homogeneous, but did act as a large geographical area where specific cultural practices and mythologies were shared.

Uniformity and diversity in the Halaf

As stated already, the Halaf period sits within the overall trajectory from village-based agricultural subsistence towards stratified, urbanized societies. The inevitability of this process has tended to be taken for granted, particularly with models of social evolution still proving convenient tools for organizing the nebulous and discontinuous data created by archaeological research (see Fried 1960; 1967; Johnson and Earle 1987; Kristiansen 1991; Service 1962). Yet urbanization was not as inevitable as the models might seem to suggest (Guidi 2002, 73–74). Rather, it is the identification of the coping mechanisms that allowed groups to live together and interact in ever-increasing numbers over greater distances that is important if we are to begin to understand the social changes that ultimately led to our own urban living. Anthropological studies have shown that as settlements grow, so does socio-economic stress, which is resolved by the population splitting, setting a size (c. 3 ha with a population of 300) above which villages find it hard to grow (Bandy 2004; 2010). Group fissioning is therefore significant in limiting settlement size in early societies. This in turn poses the question of how small-scale agricultural societies overcame the impulse to divide, creating the first large agglomerated communities such as Domuztepe.

A long trajectory of sophisticated social adaptations can be traced back through the Neolithic in the Middle East, pointing to the development of coping mechanisms to deal with societal stress (Watkins 2010). An interesting source of comparisons for the events described above are mortuary rites from the Pre-Pottery Neolithic B period, which were arguably designed to promote social cohesion and uniformity through supressing diversity and social difference (Goring-Morris 2000, 124–125; Kuijt 1995). Secondary burial, disarticulation of skeletal material, and skull caching were associated with locations that facilitated wide community participation (Kuijt 2000a, 148). Post-mortem processing of bodies suppressed individual identity (diversity) in favour of the veneration of ancestral ties and promotion of a community's shared history (uniformity) (Banning and Byrd 1987, 321–323; Byrd 1994, 656–661; Croucher 2012, 93–154; Kuijt 1996; 2000a; 2000b; 2001; 2002; 2008; Kuijt and Goring-Morris 2002, 419–423). These transformations may reflect attempts to cope with the socio-economic stresses associated with the changing economic and subsistence strategies of the Middle PPNB and the growth of permanent large-scale centres such as Jericho (Bar-Yosef 1986, 159–162; Bar-Yosef and Alon 1988, 28; Kenyon 1960, 54–56; Naveh 2003, 94; Rollefson *et al*. 1992, 444; Rosenberg and Redding 2000, 39–40).

For the Halaf population living at Domuztepe, the Death Pit burial was arguably a manifestation of belief systems that reaffirmed social values at the supra-household level and reinforced concepts relating to uniformity, such as ancestry or group identity. The burial was made in an area that was already open or deliberately cleared and that was adjacent to the Red Terrace, a feature that would have had a long-term association with ceremony and feasting by the time the Death Pit was created. The location would potentially have facilitated widespread community participation (Campbell and Healey 2011, 328). The high levels of fragmentation and dismemberment seen amongst the human bone within the Pit (Kansa *et al*. 2009a) would have obliterated individual identity within the burial completely. The marking of the burial with posts, the placing of human remains around the Pit, and the concentration of beads and amulets on its western edge (Campbell and Healey 2011, 328; Carter *et al*. 2003, 125) suggest that people returned to and reconnect with the burial and its feasting events subsequently. The feasting activities from the Red Terrace and the Death Pit were therefore part of a setting in which relationships with a focus on uniformity were established and reinforced, whilst social diversity and thereby social tension were possibly suppressed.

Members of the society living at Domuztepe did have access to luxury or prestige goods, as shown by finds such as worked native silver, ground and polished obsidian, or exotic goods such as *Dentalium* shell, and therefore could have demonstrated emergent social diversity or incipient hierarchy (Campbell *et al.* 1999, 415–416; Carter *et al.* 2003, 125–130; Healey 2007, 173; Healey and Campbell 2014). It is notable that such items were not deposited in high numbers within the Death Pit itself, reinforcing the suggestion that the burial was not about establishing élite identities but linked to community relationships and ancestral connections. It is probably significant that two of the three native silver items found at Domuztepe, both beads, were found in the deposits immediately surrounding the Death Pit, making them small but significant elements within the deposits around the Pit's edge. This further indicates that although members of the society living at Domuztepe had unequal access to exotic goods (social diversity), efforts were being made to ameliorate such social differences and the ensuing tensions (social uniformity). In this example, incorporating the beads into a deposit potentially focussed on a communal past not only aligns the giver with that particular ethos but also reinforces the status of the owner in showing that they can afford to effectively give items of value away (Weiner 1992).

Indicators of social uniformity also connected with the Death Pit include the deposition of pottery and lithics. When pottery recovered from the burial was compared with contemporaneous deposits elsewhere on the site, no significant differences in the proportions of ware types present could be perceived. In contrast to the Ditch, the pottery in the Death Pit had no obvious specialized wares for feasting, despite the faunal evidence for extraordinary levels of food consumption. A similar pattern was discerned for the chipped stone (Campbell and Healey 2011, 329). It was also notable that no complete ceramic vessels could be reconstructed from the sherds found. This initially suggested that the Pit was filled with soils derived from the surrounding site and which coincidentally contained artefact fragments. However, physical joins consistent with fresh breakage were identified between sherds found across different phases of deposition in the Pit. The deposition of broken sections of the same vessel at different stages of the burial ritual perhaps suggests such material may have been deliberately placed within the Death Pit and other sections retained elsewhere (Chapman 2000a, 49–68; Fletcher and Campbell 2015). A pot recovered from the Pit had been deliberately divided prior to firing, further supporting this idea (Fletcher and Campbell 2015, fig. 9.10). It is possible that the very ordinariness of many of the fragmented objects within the Pit expressed enchained relationships that linked the burial with everyday life in the Domuztepe community (Chapman 1996; 2000a; 2000b; Fletcher and Campbell 2015; Irving and Heywood 2004).

Uniformity and diversity in the Halaf: concluding remarks

It can be seen that in the Halaf period, both small-scale intra-site and large-scale inter-regional communication (uniformity) can be identified alongside significant social developments of increasing complexity (diversity). It has therefore become clearer that the question is not so much whether the Halaf is uniform or diverse, but how the material culture record manages to be both uniform *and* diverse and how this relates to the social changes that were taking place at the time. Our understanding of the Halaf in terms of chronology, extent, and characteristics has moved beyond the application of a simple tick list of traits and there is a more detailed appreciation of the similarities and differences, in terms of material culture and the activities to which artefacts relate, both within and between sites. The spread of ceramic styles that started in the late seventh millennium is really how the "Halaf" is identified in the archaeological record. With this fresh appreciation of the phenomenon, new ways of accounting for this widespread material culture change related to social and commensal acts have developed. Case studies such as the evidence from the site of Domuztepe appear to support these theories, but have also led to a re-assessment of how social change and emerging complexity were negotiated. At Domuztepe the manipulations of material culture during feasts and within burials both supressed and developed social diversity. An emphasis on communality and community, the suppression of individual identity, and the fragmentation of material culture may have helped the large, agglomerated social group living within the settlement to remain together and avoid group fission. Being "the same but different", both uniform and diverse, may be an important piece of social engineering that allowed population groups to deal with social tensions, ultimately facilitating the growth of significantly larger and more complex urban populations.

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CHAPTER SEVENTEEN

UNIFORMITY AND DIVERSITY IN MISSISSIPPIAN POLITY FORMATION

ROBIN A. BECK

Introduction

The dual themes of uniformity and diversity have long guided archaeological research on the Mississippian phenomenon, which spread throughout much of what is now the eastern United States from AD 1000 to 1600. Uniformity pushes us to specify the factors that mark the remains of Mississippians from those of others—their antecedents, contemporaries, and descendants—who were not. What makes Mississippian *Mississippian*? It is just as critical, at the same time, for us to appreciate the extraordinary range of diversity among the varied peoples, societies, or cultures that we are inclined to bundle together under this label. Given that such problems are relevant to recent studies of Europe's Linearbandkeramik (LBK) phenomenon, there is much to recommend considering the Mississippian expansion as part of a broad, comparative perspective on the LBK. At cursory glance, there are similarities in the intellectual histories of both concepts, as well as in how modern archaeologists conceive these distinctive phenomena. As with the LBK, the origins of the Mississippian concept lay in early ceramic analysis. More importantly, both Mississippian and the LBK witnessed the widespread adoption of agricultural economies across their respective places—along with the related developments of social inequality and political hierarchy—and both unfolded across continental or semi-continental scales.

In this chapter, I offer a general overview of the Mississippian, one that I hope will make a useful contrast to the LBK, both in its history as an archaeological concept and in the nature of the phenomenon itself. In doing so, I suggest that any understanding of Mississippian that aims for social history must account both for uniformity and diversity, similarity and difference. That is, we must ask what kinds of factors led diverse peoples

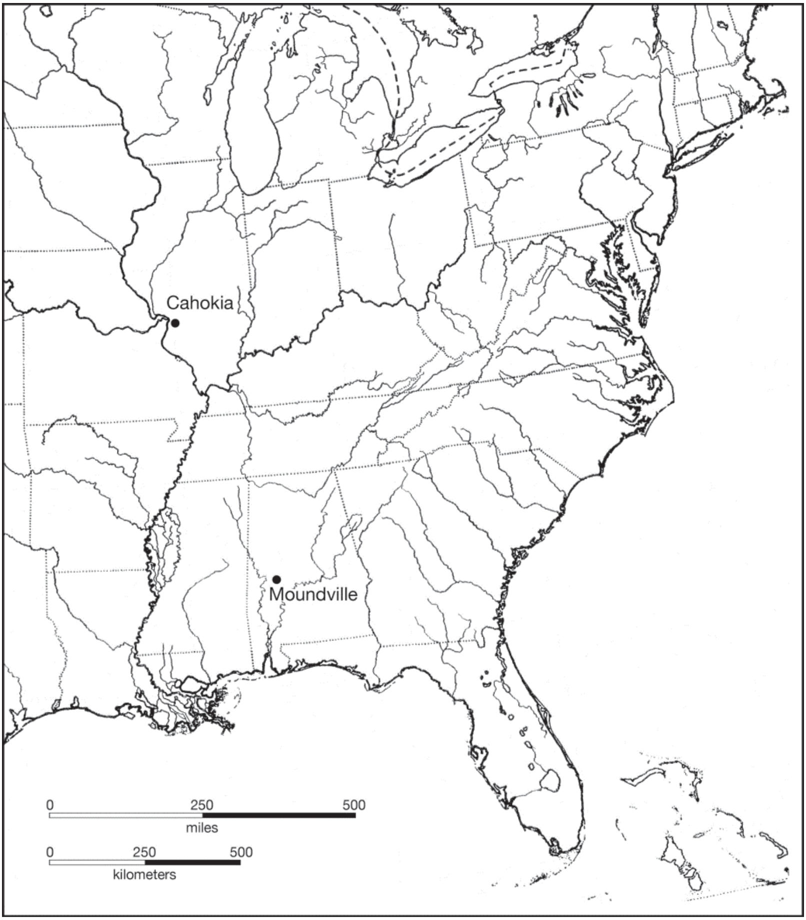

Fig. 17.1 Map of eastern United States showing the locations of Cahokia and Moundville.

with particular local histories to adopt a range of novel practices and beliefs born elsewhere and to subsequently adapt those practices and beliefs to their own knowledge and needs. First, I briefly outline the history of the Mississippian concept, illustrating its shift from a category of ceramic classification to its current treatment as a socio-cultural movement. Next, I summarize our present-day understanding of the Mississippian world, moving from its immediate precursors in what is referred to as the Late Woodland period (AD 500 to 1000) through its beginnings, florescence, and decline. Most of us today would see only a handful of practices linking Mississippian peoples across time and space; as noted, there is a tremendous amount of variability in material culture, in language, and in other cultural features outside of these few unifying practices. So rather than try to describe that variability here, which is hardly feasible given space constraints, I focus on comparing the process of polity formation in the two well-studied cases of Cahokia and Moundville (Fig. 17.1), examining variability and convergence in social processes rather than in material culture traits.

Maize and Mounds in Eastern North America

In his 1814 *Views of Louisiana*, a first-hand description of the vast new territory along the Mississippi River that President Thomas Jefferson had recently purchased from Napoleon, Henry Marie Brackenridge gives us the earliest published description of Cahokia, and indeed, one of the earliest references to any site that we would now identify as Mississippian. On recalling his first impression of Monks Mound, standing some 30 m high, he exclaims, “What a stupendous pile of earth!” (1814, 187). Given prevailing racial stereotypes of the nineteenth century, neither Brackenridge nor most of his contemporaries believed that Native Americans were capable of building this and the other massive earthworks discovered by settlers of the new American republic as they pushed their way over the Appalachians and onto lands claimed by diverse native peoples. Instead, they concocted a bewildering range of alternative theories, most of which—including a major religion, Mormonism—we typically lump together today as part of the moundbuilder mythology. What all of these theories have in common is the single-minded insistence that such imposing mounds and earthworks could only have been built by someone other than the ancestors of those very peoples being systematically dispossessed of their territories. So we find Scythians, Toltecs, Vikings, the Lost Tribes of Israel, Phoenicians, the Hernando de Soto expedition, and even survivors from the lost continent of Atlantis given credit for moundbuilding as Manifest Destiny marched westward. Not until the final years of the nineteenth century, when the task of dispossession was all but complete, did America’s science establishment, with the authority of the Smithsonian Institution, recognize American Indians as the only builders of American mounds (Thomas 1894).

Mississippian was the last great moundbuilding tradition of the Eastern Woodlands. The term itself—whether in its current form or in its earlier “Middle Mississippi” iteration—has a long history in American archaeology, beginning with W. H. Holmes' monumental analyses of native ceramics during the last two decades of the nineteenth century (1886; 1903). It has persisted through a series of shifts in archaeological method and theory, from the Midwestern Taxonomic System of the 1920s and 30s (Deuel 1937) through the culture-historical perspectives of the Post-WWII era (Griffin 1952; Willey 1966; Willey and Phillips 1958) and the ecological-adaptionist scenarios of the 1970s (Smith 1978). Today, few North American archaeologists would propose a single way of defining Mississippian, nor rely on a set list of material traits (Thorne Deuel once proposed no fewer than 16 such distinguishing characteristics). Most of us, rather, recognize that the concept subsumes an enormous range of cultural, linguistic, geographic, and political variability. Yet the term must surely refer to something more than just a block of time; it is hardly sufficient for each of us to know Mississippian when we see it. Here, I return to the idea that Mississippian was the last great moundbuilding tradition in the Eastern Woodlands, a tradition that stretches back more than 5000 years. What makes Mississippian different from earlier earth-moving traditions is that its political economy was based on an agricultural lifeway introduced from Mesoamerica by way of the American Southwest. And maize—the product of that lifeway—carried with it the potential for radical and durable transformations in social and political structures. Mississippian, then, as I see it, lies at the intersection of mounds and maize.

The piling of earth into mounds has a deep history in eastern North America. The earliest known mounds are those at Watson Brake in Louisiana, begun approximately 3500 BC. Watson Brake, indeed, is the oldest dated architectural complex of its kind in the Americas (Saunders *et al*. 2005), and its eleven mounds surrounding an oval plaza would prefigure the mound and plaza arrangement of Mississippian mound groups more than 4000 years later. The Lower Mississippi Valley and adjacent areas remained the centre of moundbuilding practices through the end of the Archaic Period, culminating with the construction of Poverty Point (1750–1350 BC), located just east of Watson Brake in north-eastern Louisiana. After a lull of several centuries, moundbuilding flourished again during the Early and Middle Woodland periods, though its centre of gravity had shifted north to the Ohio Valley, where Hopewell (200 BC–AD 400) peoples created some of the most extensive geometric earthworks in the world; the largest of these, at Newark, once covered more than 1200 ha. Although Midwestern moundbuilding declined with Hopewell after AD 400, the Late Woodland Troyville (AD 400–700) and Coles Creek (AD 700–1200) cultures, located in the Lower Mississippi Valley not far from both Watson Brake and Poverty Point, would continue the moundbuilding tradition. Significantly, the Coles Creek peoples would introduce a new kind of mound, a truncated pyramid that served as a foundation for wood buildings, which they arranged around open plazas. This combination, the platform mound and plaza complex, later became the prototype of Mississippian ceremonial spaces (e.g. Steponaitis *et al.* 2015).

The development of Mississippian society is inextricably tied to the growing significance of maize agriculture throughout most of the Eastern Woodlands during the period from AD 500–1000, which archaeologists identify as the Late Woodland. Maize (*Zea mays*) was not native to this region, having first been domesticated in the highlands of southern Mexico by c. 6000 BC. Small amounts of maize have been recovered from Ohio Hopewell sites that date to the first two centuries AD, indicating that use of this plant has a long history in eastern North America (Riley *et al.* 1994). During Hopewell times, however, its consumption was likely restricted to special or ritual events, such that it never made an important contribution to Hopewell diet. Rather, Middle Woodland peoples such as the Hopewell and their contemporaries joined a hunting and gathering subsistence with the cultivation of certain seed crops that were native to the Eastern Woodlands, particularly maygrass, sunflower, and sumpweed.

As native farmers continued to experiment with maize during the Late Woodland period, they recognized that it had clear benefits over those traditional seed crops. First, maize provided higher-yield harvests than any native cultigens and had a much higher caloric value. This was no small matter, for the Late Woodland was a period of population growth in much of eastern North America, and as the size of local populations grew, that of their hunting and gathering territories shrank. By focusing more attention on maize, Late Woodland groups were able to intensify food production in smaller catchment zones, even though the clearing and maintenance of maize fields required a higher investment of labour. Just as importantly, it is far easier to harvest and store maize than any of the native seed crops so vital to previous generations. Nimble fingers were needed to harvest the latter, but younger children and the elderly could help to pick maize given the relative ease of removing cobs from their stalks. This shift to maize agriculture thus provided substantial benefits, up to a point, for having access to larger groups and their potential labour. Finally, since maize is storable for long periods of time, people had greater incentives to produce surpluses. As George Milner has observed, however, we need not presume that there was significant top-down management of these changes to farming regimes; rather, "the impetus to grow maize bubbled up from below; that is, from decisions made by individual households" (2004, 123).

This link between labour and surplus was a key part of the cultural context in which larger polities began to develop across the Midwest and South after AD 1000. As competition for the best agricultural lands intensified, so too did competition for the labour needed to clear, plant, and harvest such lands and defend them from others. The leaders of those families and communities with claim to particularly desirable locations actively sought to draw new people to their groups, as more people produced bigger surpluses and offered better defence. Also, drawing new people could create debt relationships, as families new to a particular location found that the better soils for farming had already been claimed by others. Many newcomers must have found themselves periodically dependent on their more affluent neighbours in times of want. They could then repay any debts by working in their benefactors' fields or by giving up a portion of their own surplus in times of plenty. Such obligations—when passed from one generation to another—literally planted the seeds of inequality and ascribed status. These relations reached beyond the community to the wider region, as those communities located in rich locations could attract more people than those in less desirable places. Larger communities enjoyed an obvious military advantage over smaller neighbours and also had more labour and surplus to apply toward political activities such as making mounds and hosting feasts. Maize may not have caused Mississippian, but the growing emphasis on maize agriculture did create conditions that made Mississippian possible.

Early Mississippian Synthesis

Unprecedented opportunities for polity building began in the American Bottom region of the American Midwest once such maize-related changes to the Late Woodland political economy were under way by AD 900. Here, as would unfold in other parts of the Eastern Woodlands over the centuries to come, well-positioned communities began to grow rapidly at the expense of their neighbours. This process, though, unfolded as much as 150 years earlier in the American Bottom than at most other locales in the American Midwest and South (with a few exceptions to which I will return). The particular socio-religious form that this process took in the Midcontinent, for which we now use the term Mississippian, was thus in a temporal position to influence other portions of the Eastern Woodlands (Anderson 1997; Knight 1997; Pauketat and Emerson 1997b). Within the American Bottom, Kelly (2002, 140) has suggested that an initial

Emergent Mississippian pattern of small communities accelerated to one of the nucleated towns during late Emergent Mississippian times, some decades prior to AD 1000. Cahokia itself may have grown to house more than 2000 people (e.g. Pauketat and Lopinot 1997, 115), while farther south in the Bottom, small, dispersed communities aggregated into larger towns such as the Pulcher and Washausen sites (e.g. Barrier 2014; Kelly 1990a; 1990b; 2002). Platform mound construction also likely began at Cahokia, Lohmann, Pulcher, East St. Louis, and Washausen (Barrier 2014; Kelly 2002; Pauketat 1994).

There now appears to be an archaeological consensus that the time right around AD 1050 was when a diverse set of Southeastern and Midwestern practices and ideas were brought together at Cahokia to create a way of life we refer to as Early Mississippian (Alt 2006; Beck 2006; Beck *et al*. 2007; Dalan *et al*. 2003; Emerson and Pauketat 2002; Hall 2007; Kelly 2002; Milner 2006; Pauketat 1997a; 1998; 2004; Saitta 1994; Schroeder 2004). In less than fifty years, the mound and plaza arrangement, the use of shell-tempered pottery, and the shift to wall trench architecture (to list several key material features of this broader culture pattern) would become recognizable as a cultural entity—Mississippian—across the American Midcontinent and Southeast. As noted, many of these features had earlier histories elsewhere (truncated mounds and shell-tempered ceramics), but were combined in a specific way to stabilize as a novel set of social structures only following Cahokia's AD 1050 event. Researchers acknowledge that dramatic changes occurred during this time, but there are a wide range of divergent positions on their significance.

Cahokia went abruptly from a linearly spaced series of houses clustered around scattered, small-scale plaza courtyards to a planned settlement of enormous scale (Fig. 17.2). Prior to AD 1050, this settlement was strung along silt and sand ridges that rose above the floodplain of Cahokia Creek. In the mid-eleventh century, an architectural focus taking the form of a massive mound and plaza arrangement was superimposed on the sprawling settlement. The raising of the mound happened in a single and quickly implemented effort. By AD 1130 it had nearly attained its final height of 30 m and covered an area of close to 7 ha (Schilling 2013). This truncated pyramid, now known as Monks Mound—the largest aboriginal monument north of central Mexico—was the conceptual hub of Cahokia's newly conceived ritual universe. Extending in four directions were large open plazas that organized public performance according to a pre-determined cosmological plan. The integrative importance of these plazas is indicated by the engineering feat that accompanied the shaping of the southernmost and largest of these, which we now know as the Grand

Plaza. Here, inspired labourers transformed the natural ridge and swale landform into a remarkably flat ground surface that stretches fully 1 km south of Monks Mound.

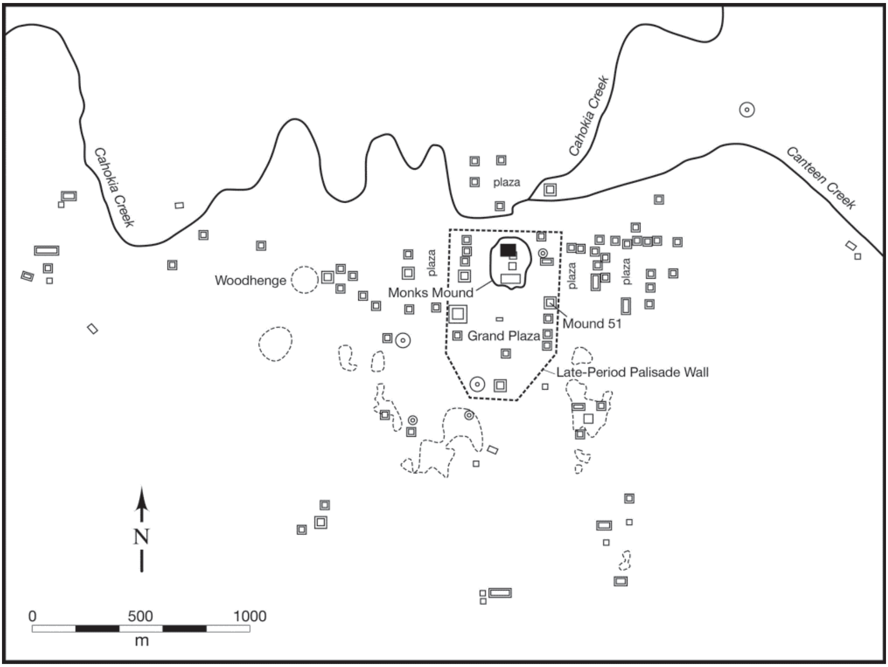

Fig. 17.2 Plan view of the Cahokia site.

On its north, Cahokia extended across the intervening flow of Cahokia Creek to integrate another community within its extended settlement plan. This unification was implemented by an inter-mound geometry along regular, measured distances. A base line set through Monks Mound was oriented with the equinoctial sunrise (Dalan *et al*. 2003, 74). The resulting plan assumed the form of a diamond-shaped zone of inter-linked, smaller-scaled communities that measured 4.5 by 3 km (Dalan *et al*. 2003, 125), and in the decades to follow no less than 100 mounds would come to stand inside this precisely defined settlement configuration.

What makes this an episode of regional import is the nearly simultaneous emergence of other large centres in the American Bottom, though none of these others exhibited the prominent central mound and cruciform plaza configuration that elevated Cahokia to a special status during the eleventh century. It seems clear, that is, that Cahokia's emergence occurred in a social context of several neighbouring centres competing to aggregate labour. There are several recent, book-length treatments on the character of Mississippian Cahokia (Byers 2010; Emerson 1997; Milner 1998; Pauketat 1994; 2004; 2013; Pauketat and Emerson 1997a), and I cannot do justice to the extent of their analyses here. What I do want to suggest, however, is that most political strategies pursued through the Lohmann and subsequent Sterling phases, from AD 1050–1200, were associated with persuasion rather than domination on the part of Cahokia's elites. In sum, the political landscape of the American Bottom during this time—during the heights of settlement nucleation and mound construction—was probably contested among competing interests rather than administered by any ruling paramounts of a centralized Cahokia.

One of the most challenging aspects of trying to understand what happened at AD 1050 in the American Bottom is the degree to which our impressions are shaped by the plan maps and bird's eye views of the impressive features often known as Greater Cahokia. These maps portray a long chain of mounds that joins Cahokia to East St. Louis before crossing the Mississippi River to incorporate the St. Louis group. There were at least 104 mounds at Cahokia itself, distributed over an area measuring at least 10 km^2 (Milner 1998, 109; Pauketat and Lopinot (1997, 109) note that Cahokia's "high-density residential area" covered 1.5 km^2). The East St. Louis group had at least 42 mounds (Kelly 1994), and there were at least 26 mounds at St. Louis before this centre's destruction (Marshall 1992). A number of single mound sites occupy the 5–6 km that separate Cahokia and East St. Louis. Cahokia was the largest of all Mississippian mound centres, East St. Louis was second, and the St. Louis group was close by in fourth place, just behind Moundville. Taken together, especially when depicted in plan view, these mound sites give the impression of a massive, centralized polity with Cahokia as the centre and its two large neighbours as secondary centres—this is what Milner refers to as the "conventional wisdom" view of political organization in the American Bottom (1998, 10–13). I suggest, however, that this view presumes a synchronic or snapshot view of relations among these centres.

First, in the time prior to AD 1000–1050, this great chain of mounds simply did not exist. This might seem an obvious statement, but it highlights the fact that what we see in that snapshot view of the central American Bottom is the outcome of social actions that unfolded over a period of time. In the Mississippian world, the activity of mound construction was tied to the forging of communal or group identities

(Brown 2006; Knight 1986; Muller 1997; Pauketat 2000). Knight identifies platform mounds as the most public of three "iconic families" (a set of sacra associated with a corresponding cult institution) in Mississippian religion, one explicitly focused on the rites of world renewal:

> "Despite their size and *communal* derivation, Mississippian platform mounds are no less sacra [...] than are embossed copper plates, engraved shell cups, or monolithic axes [...T]he symbolism of the earthen platform is that of an icon representative of earth, manipulated by periodic burial as a temporary means of achieving purification in the context of a *communal* rite of intensification" (Knight 1986, 678, italics added).

Group-building activities like platform mound construction, in a landscape marked by population aggregation and the production of agricultural surplus, are promoted by rival factions attempting to attract followers at the expense of their rivals; that is, moundbuilding and aggregation suggest competition. The fact that most of these American Bottom platform mounds cluster into distinct groups—at Cahokia, East St. Louis, St. Louis, and Pulcher, for example—and that these and other centres retained large nucleated communities (Kelly 2002, 143; Pauketat 1994, 74), indicates that local competition was pervasive through the Lohmann and Early Stirling phases, and that leaders at these and perhaps other centres were actively aggregating followers and negotiating their own statuses in the American Bottom's social venue. Although the sheer volume of Cahokia's mound construction far exceeds that of any other centre, with its resident population growing to as many as 10,000 people, its authority during this time was probably more persuasive than coercive, with other centres maintaining local authority over their own followings.

What is more, most of these large centres had their own mortuary mounds, including Big Mound at St. Louis, the Cemetery Mound at East St. Louis, the burial mound at Mitchell (a large, multi-mound centre c. 10 km north of Cahokia), along with the Powell and Rattlesnake mounds at Cahokia proper. Although most of these were destroyed before the widespread use of modern archaeological techniques, such that very little is known of their construction histories, it is clear that burials in these mortuaries were entombed with a range of non-local items including copper, mica, marine shell (particularly marine shell beads), and finely crafted stone ornaments and tools (e.g. Milner 1998, 131). Given that single burial pits in these mortuaries often included multiple skeletons or piles of disarticulated bones, and that non-local materials do not appear to have been associated with specific individuals, Milner argues that "[t]here was a strong communal emphasis in the burial of people in virtually all of these mortuary features" (1998, 132). That such funerary mounds in the American Bottom were dispersed at multiple large centres reinforces the idea that the high-ranking status groups at these sites were constructing socially distinct identities and did not simply identify themselves as peripheral members of Cahokia's elite.

Other lines of evidence from the Early Mississippian also display evidence of communal strategies in a competitive landscape. Gifting is one of the means that would-be leaders in these settings use to promote and maintain regional power. Pauketat (1994; 1997a; 1997b) and Trubitt (2000) have shown that non-local goods and raw materials occur most frequently at Cahokia and across the greater American Bottom through the eleventh and twelfth centuries AD. However, as Trubitt (2000, 678) suggests, the mere quantification of non-local goods can be deceiving. When comparing pre- and post-AD 1200 assemblages, she observes a shift from mass-produced goods like shell beads, presumably for wide-spread distribution, to a more limited production of one-of-a-kind objects made of copper and shell. This suggests that Early Mississippian constituencies at Cahokia used mass-produced exotic goods both to attract and maintain their own followings and perhaps to influence the legitimacy of similar constituencies elsewhere in the American Bottom. Finally, analysis of debris from the sub-Mound 51 borrow pit at Cahokia (Pauketat *et al.* 2002), on the east edge of the Grand Plaza, indicates that early leaders sponsored large-scale, communal feasts in association with large building events. Feasting is a key strategy for creating followings (Dietler and Hayden 2001), and these data also suggest that factions at Cahokia were aiming to forge communal identities during Cahokia's Early Mississippian boom.

The summary that I have outlined is largely in keeping with Milner's "alternative model" of chiefly authority in the American Bottom, in which he favours a "comparatively decentralized" view of the greater Cahokian regional system, which includes East St. Louis, St. Louis, and other large centres (1998, 13–14). According to this view, "[v]ariation in the numbers of mounds would have been a function of site longevity, the strength of a succession of chiefs, and the size of the population from which labourers could be drawn" (Milner 1998, 14). Returning to that (relatively) un-mounded American Bottom right at AD 1050, it is reasonable to conclude that the catalysing events of the Mississippian emergence took place at Cahokia proper, materialized perhaps in the construction or elaboration of Monks Mound and the Grand Plaza (e.g. Dalan 1997, 93; Pauketat and Lopinot 1997, 108). Large numbers of people relocated to the centre, and its leaders directed the formal layout and organization of its architectural space. These events, however, did not take place in a political and economic vacuum. Leaders and their constituent factions at other locales in the American Bottom drew upon many of those ideas put into practice at Cahokia—and almost certainly contributed others—creating a socially contested landscape. Centres such as the East St. Louis and St. Louis mound groups must have enjoyed greater longevity than smaller centres like Washausen, and also likely enjoyed a substantial degree of autonomy from Cahokia. This is not to suggest that such centres were Cahokia's equals, politically or ritually; it is to suggest that top-down models fail to consider the persuasive politics that develop in a competitive landscape, and thus mask evidence of contestation at Cahokia during the Early Mississippian period.

Middle Mississippian Transformation

The Mississippian phenomenon thus finds a generally agreed-on time and point of origin in the mid-eleventh-century American Bottom. By c. AD 1100, that set of material culture practices first brought together at Cahokia and neighbouring centres—the mound and plaza complex, the use of shell as a tempering agent in ceramics, and the building of wall trench architecture—had begun to spread across the American Midwest and Southeast, areas that were already primed for change given widespread adaptations to the maize production cycle after c. AD 900. Sites and regions outside the American Bottom with evidence of Early Mississippian settlement include the Lower Illinois River valley, the Shiloh and Obion sites in western Tennessee, the Kincaid mound centre in southern Illinois, and the Macon Plateau site and associates sites situated near the Fall Line of the Ocmulgee River in central Georgia.

The expansion of LBK settlements across central Europe has sometimes been likened to a wave that spread rapidly (in archaeological time) over much of central Europe (e.g. Ammerman and Cavalli-Sforza 1984), perhaps in as little as four centuries. In this so-called wave of advance model, migration unfolded not as long-distance movements but as relatively small-scale advances in which Neolithic LBK farming communities fissioned or budded off and moved short distances in search of new land, displacing Mesolithic hunter-gatherers in the process. Although the model has been criticized for oversimplifying what are obviously complex demographic processes (e.g. Anthony 1990), there does still seem to be an emphasis on migration and population replacement as significant factors in the LBK expansion. Migration has recently gained some analytical favour among Mississippian archaeologists, but in a different way than is the case with the LBK. While some Early Mississippian mound centres like Macon Plateau in Georgia and Aztalan in southern Wisconsin are generally viewed as cases of emigration or out-migration—the founders of Aztalan likely moved from Cahokia itself, a distance of more than 560 km—these tend to be exceptions in the Mississippian world. Instead, population movement usually took the form of immigration, as people abandoned their rural homes and aggregated at large centres like Cahokia (e.g. Alt 2006; Pauketat 2003; Slater *et al.* 2014). Moreover, centres such as Macon Plateau and Aztalan appear not to have Mississippianized their Late Woodland neighbours (for Aztalan, see Birmingham and Goldstein 2005; Salkin 2000; for Macon Plateau, see Williams 1994).

During most of the Early Mississippian period, there is little evidence for clearly defined social hierarchies at Cahokia or any other early centres. By about AD 1200, however, the nature of Mississippian appears to have changed, from a ritual-religious movement that drew adherents through an emphasis on communal ideology to one that legitimized formal inequalities. Trubitt's (2000, 673) study of household data from sites in the American Bottom indicates that the division of household units into smaller/poorer and larger/wealthier increases after AD 1200. Comparing the density of non-local items at Cahokia with the density of such materials at outlying sites, she has observed that "[t]here is evidence that there was more status or wealth differentiation between households *and* between sites after AD 1200 in the American Bottom" (2000, 674). In addition, as larger households at Cahokia began to withhold significantly greater shares of exotic materials such as Mill Creek chert blades, non-local minerals, and decorated pottery, so too did they begin to centralize production and exchange of shell beads, an artefact type that was widely distributed during the Early Mississippian period (Trubitt 2000, 675–676). It is unlikely that such changes to the household political economy were linked to a *decline* in centralized authority. Instead, these transformations may have been linked to the rise of a regional aristocracy at Cahokia.

At the same time as these changes in household economy, large numbers of people began moving away from Cahokia and investing less labour in new mound construction. Cahokia's new elites, in the meanwhile, initiated the construction of a massive palisade in the central ceremonial precinct. The Central Palisade enclosed Monks Mound and the Grand Plaza and was rebuilt three times over the next century (Trubitt 2000, 680). Milner (1998) suggests that the Central Palisade demanded a more coordinated and centralized mobilization of labour than all of the earth-moving activities at Cahokia—including the building of Monks Mound—combined. While this wall could certainly have satisfied defensive needs, it would also have acted as a physical and psychological barrier to what we may presume were among Cahokia's most sacred zones, zones that were, until this construction, communal and open to public view. Significantly, there is little to suggest that people aggregated behind the walls of the Central Palisade at Cahokia, but rather moved away in large numbers from the centre's supposed safety. Cahokia's aristocracy may have sponsored this palisade and its refurbishing not to draw their followers and adherents inside, but rather to create a cosmological distance between those within and those without.

The relative decrease in exotic raw materials across the American Bottom after AD 1200 coincided with the production of special, one-of-a-kind objects such as engraved shell cups and gorgets and repoussé copper plates; the production of shell objects may have been controlled by large households at Cahokia (Trubitt 2000), and the production of copper plates may have taken place in the area around Mound 34, one of the few new earthen mounds built at Cahokia during the thirteenth century (Brown and Kelly 2000; Perino 1959). The controlled crafting and distribution of these symbolically-loaded objects is quite distinct from the controlled production of beads and axeheads during Early Mississippian times. While the latter were mass produced and distributed for general consumption, the former seem to have had a much more restricted access due to their concentration in elite mortuary contexts at Middle Mississippian mound centres such as Etowah, Moundville, Lake Jackson, and Spiro. Few shell and copper cups, gorgets, and plates have been recovered from burial contexts at Cahokia, though Brown and Kelly (2000) make the compelling case that all shell cups, shell gorgets, and copper plates decorated in a particular style, referred to as the Braden style, were manufactured by specialized artisans at Cahokia during the period from approximately AD 1200 to 1250.

By AD 1250, Cahokia had begun a steep and rapid decline, the causes of which are still contested among scholars. Over the next two centuries, though, many new Mississippian centres emerged in the south-eastern Unites States. The period from AD 1200 to 1400, referred to as the Middle Mississippian period, witnessed the florescence and expansion of Mississippian lifeways and culture. Some of the most important mound centres from this period include the Moundville site in Alabama, the Etowah site in Georgia, Oklahoma's Spiro Mounds, Florida's Lake Jackson site, Winterville and Lake George in Mississippi, and Angel Mounds in Indiana.

Along Alabama's Black Warrior River, a shift from nucleated Late Woodland settlements to smaller, dispersed farmsteads occurred just after AD 950 as a likely consequence of increased maize intensification. Population density along the Black Warrior was relatively low during this time—considerably lower, for example, than along the neighbouring rivers such as the Tombigbee and the Alabama (Knight and Steponaitis 1998, 12). Moundville itself was first occupied about a century later, by AD 1050, and rapidly gained an especially dense concentration of people. Also, only two known platform mounds were built in the valley before AD 1200, and both were on the Moundville terrace (Knight and Steponaitis 1998, 13). Moundville already exhibited many of the hallmarks of Mississippian material culture, such as platform mounds, wall trench buildings, and shell-tempered pottery, a combination that had its origins in the American Bottom.

Moundville transformed between AD 1250–1300, as what had once been a dispersed and unstructured community became a planned and highly structured town (Knight 2010, 361). Each of the major mounds was begun during this time, and public and domestic zones were carefully organized around the large central plaza (Fig. 17.3). Knight and Steponaitis interpret Moundville's layout of more than twenty mounds as a formal sociogram "in which the placement of mounds around the plaza reflects ranked status relationships among kin groups" (1998, 17). A palisade enclosing the entire 75 ha settlement was also built at this time, and Knight and Steponaitis (1998, 15) estimate that Moundville's resident population grew to perhaps 1,000 people. As at Cahokia, importation of exotic materials increased significantly during this aggregated phase, as burials from this time exhibit a higher per capita frequency of copper and shell than at any other period in Moundville's settlement history (Knight and Steponaitis 1998, 16).

During the short time from AD 1200–1250, Moundville's leaders drew a large proportion of the Black Warrior's population to their settlement on the Moundville terrace by emphasizing a broadly shared or communal identity and group-building activities such as palisade and platform mound construction, as well as offering unrestricted access to exotic raw materials. Moundville's ideology through this half-century appears almost entirely focused on persuasive politics and the forging of group identity, much like that of Cahokia during the period immediately following its initial aggregation. Although Moundville's architectural elaboration was of a grander scale than the vast majority of Mississippian towns, it was not qualitatively different during this time. That is, most Mississippian towns were marked by mounds, palisades, and carefully configured public and

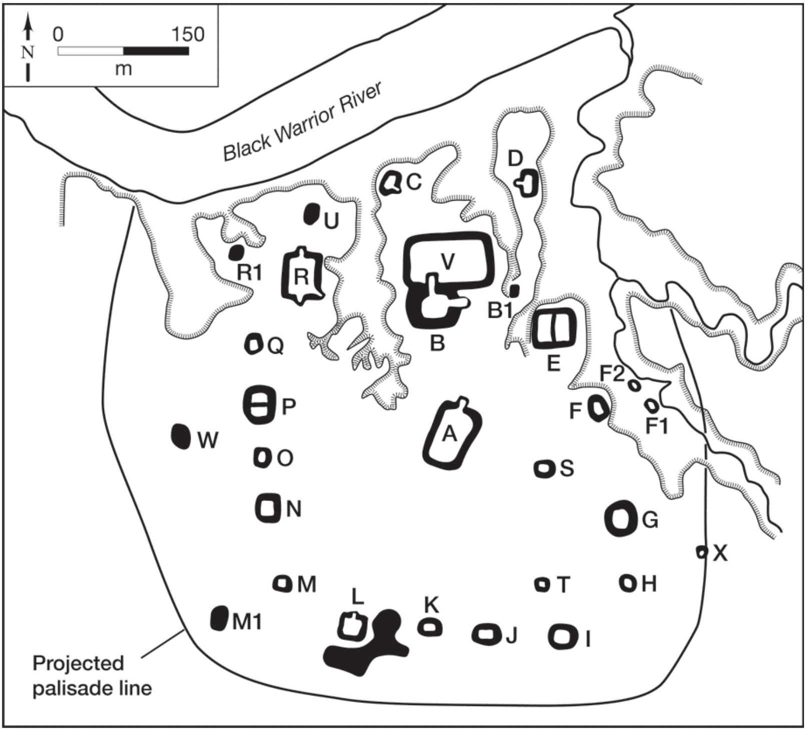

Fig. 17.3 Plan view of the Moundville site.

domestic zones. By AD 1300, though, Moundville had changed dramatically once again, in a way that mirrors Cahokia's transformation post-AD 1200.

Between AD 1250–1300, most of Moundville's residents abandoned their regional centre, and its defensive palisade had no reconstruction episodes after this time. Furthermore, more than half of those mounds built in the previous period were abandoned by AD 1400, particularly those along the southern boundaries of the central plaza. Moundville became a necropolis, the regional centre of mortuary practice (compare with the American Bottom during the time AD 1050–1200, where several local centres had mortuary mounds), and was likely occupied by a few "caretaker" elites and their retainers (Knight 2010, 352). Several secondary centres with a single mound each were founded north and south of Moundville and presumably served as local nodes in the polity's administrative organization. These secondary centres, all of which measure less than one hectare in size, were probably occupied by elites closely linked to the regional aristocracy at Moundville (Knight and Steponaitis 1998; Mistovich 1995; Welch 1998). At this time, "there is no sign of a nucleated settlement in the Black Warrior Valley" (Knight and Steponaitis 1998, 20).

In addition to transformations in the Moundville site itself, the presence of Moundville's aristocracy became highly conspicuous by AD 1300, about the same time that the settlement was abandoned by most of its people. Knight and Steponaitis propose that "a chiefly cult symbolism became elaborated [with] certain burials decked out with luxury goods and costumery bearing this symbolism" (1998, 17). These elite goods include marine shell beads, copper gorgets and ear spools, notched stone paint pallets, galena crystals, and mineral-based pigments. One adult male was buried with three sheet copper gorgets, a sheet copper hair ornament held in place by a bison horn pin, anklets and bracelets of copper-covered beads, a necklace of drilled pearls, an amethyst pendant carved in the form of a human head effigy, and one of seven copper-bladed axes known to have been recovered from the site (Knight and Steponaitis 1998, 18). Significantly, all of these elaborate burials date to the period from AD 1300–1400. Knight has associated these elite goods with another of three iconic families in Mississippian religion, the warfare/cosmogony complex:

> "the data suggest that its cult was not [...] communal, but instead was particularly exclusive, consistent with a single, genealogically determined corporate group of greater magnitude than an individual family. This points, then, to a type of cult institution whose membership was ascribed solely by virtue of belonging to privileged unilineal descent groups or clans [i.e. an aristocracy]" (Knight 1986, 680).

Although the platform mound and warfare/cosmogony complexes may have evolved together as parts of an Early Mississippian whole (together with a temple statuary cult), Mississippian elites promoted each according to specific strategies in particular historical circumstances.

The period from AD 1300–1400 represents a significant shift in the strategies pursued by Moundville's leaders. The centre was abandoned by most of its resident population, as were the palisade and many of the southern mounds, while secondary mound centres were constructed to organize the flow of labour and tribute from dispersed local communities. Mortuary data indicate that access to exotic goods grew more restricted and that a new cult symbolism emphasizing the status of specific individuals or their limited constituencies became elaborated at the expense of broader, corporate identity and ritual. Moundville's leaders, in effect, drew enough followers to overcome the threat of local competition and established a radical institutional restructuring (e.g. Spencer 1987, 382). The group-building features of the Early Mississippian ideology, associated with the aggregation of followers, were superseded by group-distancing strategies that reinforced the prestige, or *otherness*, of a regional aristocracy; this new segregation is indicated both by the movement of the masses out of the sacred centre and by the restricted access to a cosmologically charged, ceremonial regalia (Helms 1998).

In the early phases of polity formation, factions at Moundville and Cahokia successfully attracted much of their respective regional populations to a single location through strategies of persuasive aggregation (Beck 2003; 2006). In Moundville's case, early success left little viable competition in the Black Warrior Valley. In Cahokia's case, there remained several local centres that, although significantly smaller than their massive neighbour, did present real obstacles to the centralization of Cahokian power. This difference may be due to the fact that population density in the American Bottom—throughout the early phases of regional consolidation—was higher than that along the Black Warrior Valley (Knight 1997, 242). A high population density may prolong or even prohibit the formation of regional polities where such polities are achieved by persuasive aggregation: high population densities make it difficult for leaders to attract enough followers to overcome competitors if available resources are insufficient to permit an adequate aggregation of people (Beck 2003, 647). The productive potential of the American Bottom did permit Cahokia's leaders to draw a following of unprecedented scale, but it also supported potential rivals trying to build their own coalitions. Cahokia's centralization of the American Bottom seems to have been slower—and was probably more contested—than that of Moundville in the Black Warrior Valley. Nevertheless, both polities did achieve a relatively high degree of centralized authority over their hinterlands, Moundville by AD 1300 and Cahokia by AD 1200.

Following their early aggregated phases, leaders at Moundville and Cahokia attempted to restructure their respective polities. The shift from group-building to group-distancing strategies might have been precipitated by scalar crises at each centre (e.g. Fletcher 1995). That is, leaders at Moundville and Cahokia enjoyed tremendous success aggregating large populations, but their very success would have strained the productive capacity of their respective locales. The people inhabiting either centre would have needed, through time, to travel further and further to work in their agricultural fields and to acquire other essential needs, especially wood and game (Lopinot and Woods 1993). Smith (1978) suggests that, given technological and ecological conditions in the Mississippian

Southeast, the optimal strategy for resource exploitation and surplus extraction was a pattern of farmsteads dispersed around a centre's agricultural lands. This strategy, though, was apposite to persuasive aggregation. The solution for this conundrum at both Moundville and Cahokia entailed a reinterpretation or revitalization of existing religious ideologies, manifested in such group-distancing strategies and practices as reviewed above. What had been communal and shared became exclusive and withheld. The contexts under which Mississippian leaders laboured to expand their institutions of chiefship presented a less than ideal scenario for building regional polities: persuasive aggregation promoted consolidation, though dispersal offered the best means of mobilizing surpluses. This conundrum may explain the instability of even the most successful Mississippian polities, and suggests why more centralized forms of integration never emerged in the Middle Mississippian context of the Eastern Woodlands.

Late Mississippian Coda

After AD 1400 there was a significant decline in platform mound construction throughout the Eastern Woodlands. The long-distance exchange of exotic materials also declined, as did the skilled crafting of special objects in marine shell and copper. Most Middle Mississippian centres were abandoned or else underwent major transformations in scale and power, including Cahokia by AD 1300 and Moundville by AD 1450. Archaeologists have offered several explanations for this decline, but none of these is universally accepted. Perhaps the onset of the Little Ice Age in the thirteenth century, which initiated a period of cooler temperatures over much of the northern Hemisphere, disrupted agricultural cycles and reduced the production of surpluses that supported Middle Mississippian aristocracies. Or perhaps the religious values and belief systems that made the Mississippian movement attractive to new adherents lost their capacity to motivate followers and were no longer enough to hold these centres together. It is important to remember, however, that this process was well under way in the century prior to European contact, so that the roots of this decline were internal to the Mississippian phenomenon itself and cannot be explained by the introduction of external agents such as European settlers and their pathogens.

This decline, however, does not mean that Mississippian polities disappeared throughout the Eastern Woodlands. Instead, many new polities emerged during the time from AD 1400 to 1600, referred to as the Late Mississippian period. Although the leaders of these new polities did not sponsor the construction of mounds as large as those of their predecessors or support as many of the specialists who crafted beautiful objects in copper and shell, many do appear to have wielded authority over neighbouring communities. The organization of these polities, many of which meet our classic conception of chiefdoms, are best known from the written accounts provided by early European explorers, especially those who accompanied the Hernando de Soto expedition, which crossed across much of the American Southeast from 1539 to 1543. Chiefdoms with names such as Apalachee, Cofitachequi, Coosa, Tascaloosa, Chicasa, Casqui, and Pacaha leap from the pages of the Soto accounts and offer important insights into Late Mississippian society.

Yet these sixteenth-century accounts would offer one of our final historical windows onto the Mississippian world. On the heels of Spanish, French, and English explorers came infectious diseases such as smallpox, typhus, influenza, and measles, against which the peoples of the Late Mississippian South had no biological resistance. Moreover, new European colonies introduced a commodity-based political economy to the Eastern Woodlands, one that compelled indigenous peoples to exchange hides and slaves to European merchants for manufactured materials such as guns and ammunition, iron tools, brass kettles, and cloth (e.g. Beck 2013; Ethridge 2010). This combination of factors, the loss of life from disease and a new mode of political economy, would undermine the Mississippians' political economy based on surplus maize and labour. While much of the Late Mississippian world had disappeared within 150 years of European contact, its legacy would live on—and lives on today—in the peoples of the Creek, Chickasaw, Choctaw, Cherokee, Catawba, Ponca, Osage, and other Indian Nations.

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CHAPTER EIGHTEEN

LAPITA AND THE LINEARBANDKERAMIK: WHAT CAN A COMPARATIVE APPROACH TELL US ABOUT EITHER?

MATTHEW SPRIGGS

By no stretch of the imagination am I an expert or even generally up to speed on the latest developments in Linearbandkeramik (LBK) studies, beyond having read the chapters of this book and a few other papers to hand here on a tropical isle in the South Pacific. I would claim some knowledge, however, of Oceania's arguably most parallel cultural phenomenon, the rapid spread of the "Neolithic" Lapita culture (Fig. 18.1) across 4500 km of mostly sea with some scattered islands some 3000 years ago (Kirch 1997; Spriggs 2013).

Reading these papers, I have to conclude of LBK and Lapita specialists that we really should talk. Both phenomena represent what Vandkilde (2007) has termed "macroregional phases of conjuncture", hot spots of rapid cultural change and spread[1]. There are other phases like this in European prehistory where a comparative view would be valuable: the spread of Cardial Ware through and beyond the Mediterranean, the Bell Beaker phenomenon, particular phases of the Bronze Age such as Yamnaya, and so on. In the Pacific we also have the perhaps even more remarkable, speedy, and widespread settlement of much of Eastern Polynesia around 1000 years ago (T. Thomas 2001; for a recent view on the dates see Spriggs 2014). Specialists from other regions can add their own examples. They are not all limited to agricultural populations: there is the colonization event in the Early Mesolithic Eastern Baltic region (Kriiska *et al*. in press) and nearer to my current location the post-glacial population expansion out of refugia in Australia that most likely spread the Pama-Nyungan language family (Williams *et al*. 2015).

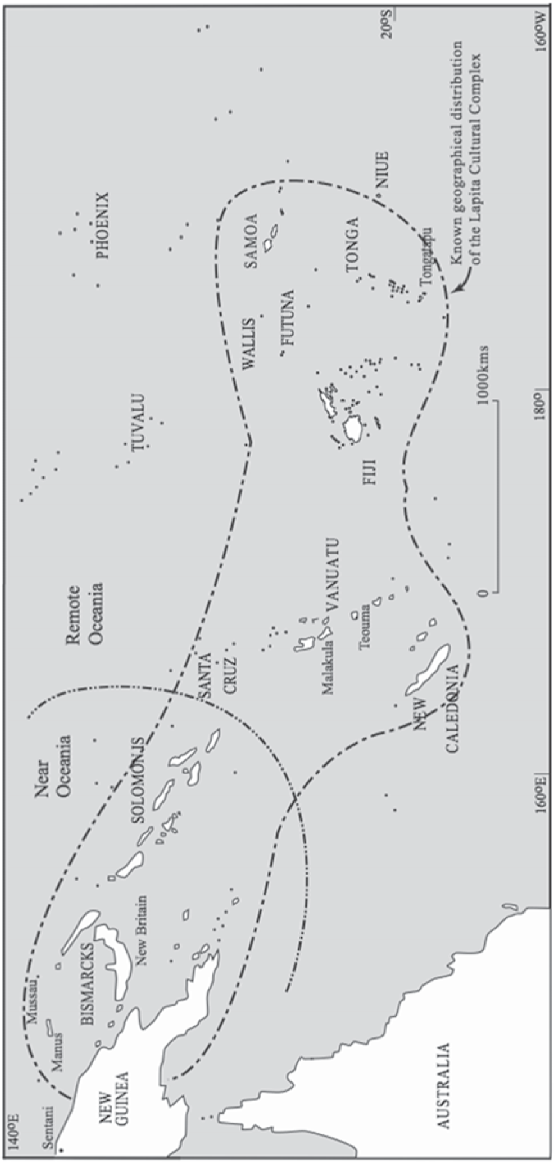

Fig. 18.1 Distribution of the Lapita cultural complex (courtesy of Stuart Bedford).

These are exciting times in Pacific archaeology, not least in Lapita studies. The range of Lapita sites has been extended west to the mainland of New Guinea within the last few years (David *et al*. 2011; Skelly *et al*. 2014). There are even hints of contacts with Australia through the finding of presumably Lapita-derived pottery on Lizard Island on the Great Barrier Reef (Lentfer *et al*. 2013) and on more than one island in the Torres Strait (Carter 2002; McNiven *et al*. 2006; Wright and Dickinson 2009). Plausible, at least generically "ancestral" Neolithic sites have also been identified further west in Island Southeast Asia (Spriggs 2011). It is now little more than a decade since the first major Early Lapita cemetery was discovered at Teouma on Efate Island where I now sit to type, and Vanuatu has produced further Later Lapita cemeteries more recently in the islands off northeast Malakula just to the north of here (Bedford *et al*. 2006; 2010; 2012). New insights into health and disease, diet, and the physical impacts of human colonization of pristine environments have been the result (Buckley *et al*. 2008; 2014; Kinaston *et al*. 2009; 2014; Valentin *et al*. 2010a). In addition, although ancient DNA has not yet been successfully recovered in a replicable manner from Lapita skeletal remains, limited morphological comparisons suggest answers to the conundrum of the origins of the Lapita peoples (Valentin *et al*. in press).

The study of the Lapita design system, most notably found on distinctive toothed or dentate-stamped decorated pots (Fig. 18.2), has also broadened in emphasis. It is no longer just the analysis of individual motifs from generally small fragments—although that remains an important strand (Chiu and Sand 2005)—but of the complete design fields on reconstructed whole vessels, studied holistically in tandem with vessel shape and petrography (Dickinson *et al*. 2013; Sand 2015).

If this paper is seen as attempting to initiate a conversation between the Pacific and central Europe, it should be noted that until a few years ago such a conversation would have been largely monosyllabic on the Pacific side. While the LBK was defined in an 1883 publication of Friedrich Klopfleisch (as cited in Pechtl 2015), the vast extent of the Lapita culture, bridging the conventional boundaries of Melanesia and Polynesia, only became apparent in the 1950s during some of the first sustained post-war archaeological expeditions to the western Pacific (Kirch 2000). Nearly 200 mainly village or hamlet sites had been found across its range before any significant numbers of Lapita burials had been located, and these only after the start of the present century. Notwithstanding the earlier pioneering thrills as its areal extent was first documented, Lapita is only now really getting interesting to talk about on the world prehistory stage.

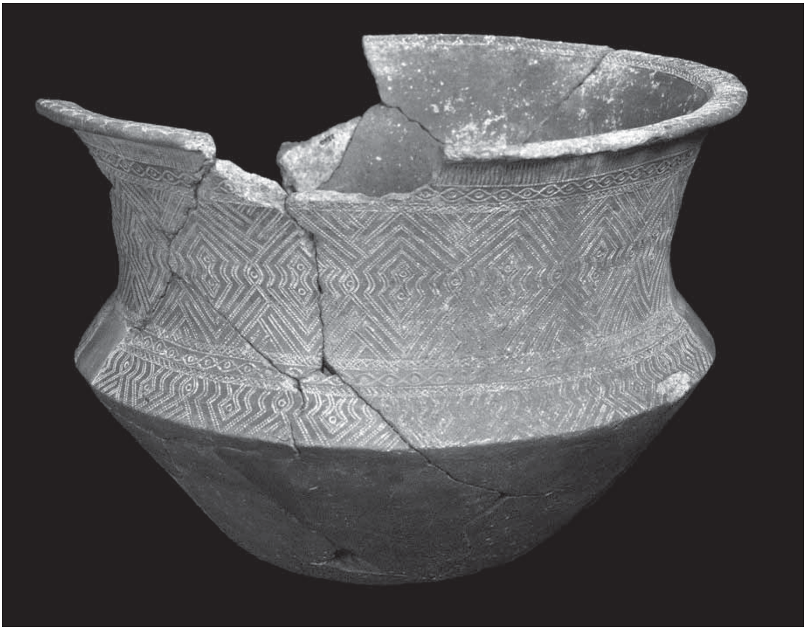

Fig. 18.2 A dentate-stamped Lapita pot from Teouma, Efate Island, Vanuatu. Photograph by Philippe Metois.

One part of that interest must surely be that only Pacific archaeology can provide the information needed to put some of the most commonly used ethnographic parallels in archaeology into historical context: Melanesian "big men" and Polynesian "chiefs", Malinowski's (1922) Kula Ring as the epitome of ceremonial exchange networks, and so on. All of these were largely described after colonial pacification had proceeded to the point where what was being described was either memory culture or had in fact been massively transformed by European contact (Spriggs 2008). Not only that but if one is analogy shopping, these are not the only items on offer in the regional supermarket: Godelier's (1986) concept of "great men" in New Guinea or the graded societies of northern Vanuatu (Bonnemaison 1996) should also deserve a trial tasting. Indeed the "great men" concept is more applicable than that of "big men" to the Early Neolithic of Europe, given that the latter may well require the presence of colonial pacification and the creation of market peace to operate in its purest form.

The call here, however, is not to replace "big men" with "great men" in one's analogies (although that might be a useful start), it is instead to compare sequences of cultural change from the areas that produced these ethnographic snapshots to examine how they came to be and how that might be similar or different to the place the analogy is being applied to. Archaeology has always done the long run better than Neolithic "ethnographies" (contrary to Tilley 1996) and this is comparative archaeology's great advantage. It is no longer defensible to mine the Pacific for analogies while ignoring the archaeological evidence and cultural sequences of the areas from where those analogies derive in order to judge their appropriateness (Spriggs 2008).

Lapita studies have remained largely within a culture historical theoretical framework, perhaps inevitable in initial phases of study to organize what few pieces of information one has. But those days are hopefully now coming to an end in the Pacific. The same monochrome tropes of migration versus diffusion have been argued out in the Pacific as with the LBK (cf. Robb 2013; Robb and Miracle 2007 for the latter), but at least since Green's (1991; 2000) "Triple I" model of Intrusion, Integration, and Innovation there has been at least some nuanced colour thrown into the Pacific culture historical mix. Yes, there was some immigration from outside the region by people bringing a "package" of domesticated crops and animals and other material baggage, and more certainly there had to be migration involved beyond the areas of Near Oceania already occupied by humans. Yes, there was some integration or mixing and matching along the way between such enclave migrants and already-present and at least partly-horticultural populations. And yes, there was likely innovation resulting from new environmental and social challenges as colonization proceeded into the pristine environments of Remote Oceania beyond the main Solomons chain.

Given the much longer knowledge of and interest in the LBK, the LBK specialist might appear to have the upper hand in the conversation. Indeed, topics such as the layout and symbolism of LBK houses (Czerniak, this volume; Beneš and colleagues, this volume) and innovative research on the genealogies of pottery production technologies (van Doosselaere *et al.*, this volume) and on ovens and the link to feasting (Pechtl, this volume) point to future fruitful directions in Lapita studies. None of these areas has received much Lapita attention as yet (but see Green and Pawley 1999 for an initial discussion of internal settlement layout). But I have hopes that the younger but keen Lapita side has something of interest to say to LBK specialists as well.

The concept of “enclave colonization”, similar in some ways to Vander Linden’s (this volume) description of the Bell Beaker Phenomenon as “archipelagic”, is brought out even better on actual islands and archipelagos, where leapfrogging colonization is clearly visible in the archaeological record. Migration as a process reaches its archaeologically “purest” form when it takes place into areas with no previous human occupation, as it did with Lapita in Remote Oceania. The archaeological patterns can then inarguably be taken as representing an actual migration event with its attendant cultural “package” revealed in all its glory. The constitution of this package by its very nature might be more generally reflective of that likely to be found in other, comparable migratory episodes, as I would argue the Earliest LBK represents. LBK specialists will judge whether any particular resonances with their own assemblages represent *déjà vu* rather than coincidence. To me at least the resemblances are almost uncanny.

In general terms the Lapita culture of the western Pacific can be seen as being at the end of the continental development of the Chinese and Southeast Asian ceramic traditions (cf. Pechtl 2015, 556 for the LBK) and is their south-eastern extension. It spread, probably by the vehicle of large sail-powered outrigger canoes, extremely rapidly over a 4500 km extent within a few centuries, clearly outstripping any putative demographic imperative (Spriggs 2013; cf. Van Wijk, this volume). Earle and Spriggs (2015) have suggested that Lapita expansion represents a rather fluid but highly competitive situation. Exploration was purposeful and systematic, based on effective navigational knowledge and technology (Irwin 1992). The goals could have been explicitly to find undiscovered islands offering easy subsistence, exchangeable products such as the feathers of exotic birds, and a basis for would-be leaders to establish themselves independently. But mounting such expeditions would have been expensive in terms of labour, the skills to build the canoes, the navigational skills to reach and return from new islands, and provisioning of new colonies. As Earle and Spriggs (2015) note, this provides a classic constriction point or bottleneck allowing for some concentration of political power.

As noted elsewhere (Spriggs in press), the thought of an uninhabited island where the younger sons of chiefs—destined never to succeed to power in the normal order of things—could establish themselves as paramount would have been a powerful incentive to mount such an expedition. Being of chiefly family might be enough to rally the resources to do so, and the ever-present possibility of destabilizing power plays by such younger sons may well have garnered wider family support for such a venture—migration as a political safety valve in a strongly competitive culture.

Lapita first appears in the Bismarck Archipelago somewhere between 3300 and 3100 cal BP seemingly already fully-formed. The most elaborately and finely-stamped decorated Lapita pottery assemblages are in fact the earliest in the region. This apparent situation may well be because of a sampling issue in Island Southeast Asia, as I have previously argued (Spriggs 2011), but no directly ancestral assemblage has yet been found west of the Bismarcks. This is eerily similar to the situation described by Robb for the LBK and Cardial expansions: "such movements tend to involve small groups with a rigidly patterned lifestyle; they are rarely typical of a single origin point, creating a perplexing pattern of 'migrations without a homeland'. What drives such groups onward is poorly known" (Robb 2013, 658–659). As with Robb's examples, it is during Lapita times that people "began to use an expanded repertory of material things" (Robb 2013, 658). They developed a "package" of pottery, polished stone adzes, a range of new shell ornaments, domesticated plants and animals—in this case pig, dog, and chicken—lived in village settlements generally targeted to immediately coastal situations, and utilized extensive funerary and domestic ritualism[2].

The "rigidly patterned lifestyle" Robb notes for the European examples is nowhere truer than of Lapita. The pottery is so distinctive that often only a single fingernail-sized sherd with a fragment of decoration on it is needed to identify the presence of a Lapita site during survey. Lapita designs were usually produced using dentate stamps, although incised and usually simpler versions of the motifs are found on what may be more typically domestic wares (Fig. 18.3). The Lapita design system, particularly seen in the pattern of bands or friezes running round the pot above the carination, was not spread by the trading of pots. That is rare. In almost all sites where Lapita pottery is found it is locally produced; the designs and perhaps the potters moved, but not the pots themselves. Despite its evident conservatism, there are stylistic developments over its range, largely temporal rather than geographical, but not enough to create any argument as to what constitutes a typically Lapita pot. Repetitive designs of anthropomorphic heads, albeit sometimes heavily abstract, are a notable feature on the most elaborately decorated vessels (Fig. 18.4).

One can map most aspects of Pechtl's (2015; see also this volume) discussion of LBK pottery directly onto Lapita—the scale of production; the general lack of trade in pots; the stylistic conservatism particularly of the earliest phases; its classic type fossil status; lack of specifically funerary wares; a clearly ritual role for the most elaborate vessel forms and

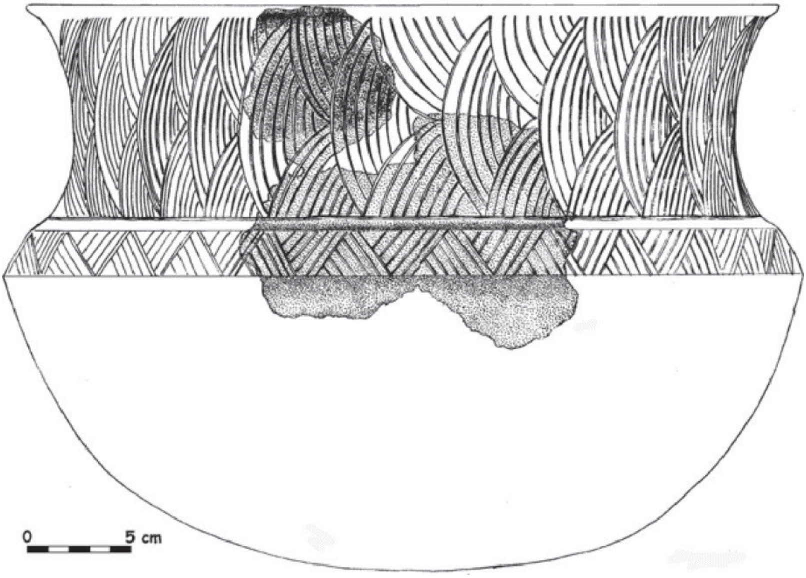

Fig. 18.3 Incised Lapita "domestic" ware from Teouma. Drawing by Fidel Yoringmal.

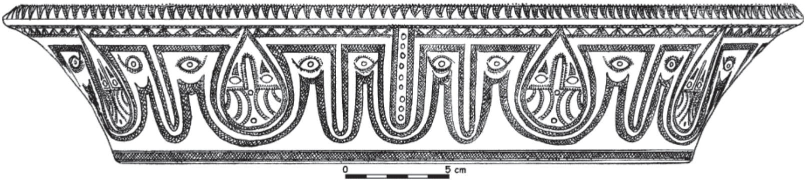

Fig. 18.4 Dentate-stamped flat-bottomed dish with anthropomorphic head designs from Teouma. Drawing by Fidel Yoringmal.

decorations, partly witnessed in the complex object biographies seen in the evidence for over-painting of designs (Bedford 2006a); the pots as a medium to communicate social and cosmological meanings; its legacy in later, more localized pottery assemblages; and even equivalent firing temperatures. Divergence occurs with LBK pottery decorations becoming increasingly complex and innovative over time, unlike Lapita—but then again LBK is a phenomenon on a much longer time scale. If we include the increasingly localized post-Lapita wares as part of a continuing tradition, we see simplification to the point of most pots becoming essentially plain, but then a reinscription of innovative and increasingly complex incised designs on pots in the course of a few centuries—the succession of Arapus, Erueti, and Mangaasi styles in central Vanuatu would be an example (Bedford 2006b).

A range of forms is found in what must surely be largely display and/or serving vessels: carinated vessels, some of very large size; flat-bottomed dishes, some of them on stands; separate potstands, themselves sometimes heavily decorated and which fit into grooves on the underside of flat-bottomed dishes; and a range of restricted bowls and other forms (Sand 2015). While they are found associated with burials at the Teouma cemetery on Efate (Vanuatu), they cannot be considered primarily funerary wares, although some of the most elaborate vessels were clearly chosen to be deposited in such circumstances. Such forms are equally represented in settlement sites, however, so partook of a range of ritual functions. In settlements there are plain or incised cooking wares associated with the more highly decorated vessels, but these are largely absent in the Teouma cemetery.

At that cemetery pots were either used as grave markers sticking part-way out of the ground, or as containers for secondary burials. Some may have been deliberately smashed over the graves (Ravn *et al*. in press). To match the heads on the pots, at Teouma there is a skull placed inside a pot (Fig. 18.5). There was clearly a skull cult of some kind practised there, as all adult skeletons at Teouma, within some 68 burial features, had had their heads removed during the elaborate funerary rituals. Many must have been taken off-site, for possible display in houses or ritual structures, but a few curated skulls were found placed on the chests or between the legs of other skeletons. Other body manipulations after death were also found at the site as part of the ritual complex reflecting continued revisitation and reopening of the graves. The dead were thus being seen as having a continued presence among and influence upon the affairs of the living. They were not separate from the living community but continuing participants within it (Valentin *et al*. 2010b; 2014; cf. Barrett 1994).

What also spread with Lapita was the ancestral form (Proto-Oceanic) of the Oceanic Austronesian languages still spoken across much of the region today; indeed it is this continuity of language which allows us to identify through historical linguistic methods the proximate Lapita homeland in the Bismarcks as being the linguistic homeland for all Oceanic languages (Pawley 2002; 2007). It also confirms the extremely rapid spread of speakers of ancestral Proto-Oceanic. The rake-like structure of its subgroups attests to just such a fast spread from the Bismarcks through to Polynesia as found with the expansion of Lapita itself. For the LBK of course, any such associated linguistic spread would have been erased through later, recently confirmed Bronze Age migrations of Indo-European speakers (Allentoft *et al*. 2015). But this does not preclude such a linguistic spread associated with the kind of rigidly homogeneous culture that we see in the Earliest LBK "enclave" colonization. The Lapita example suggests this may have been an important factor allowing such a rapid spread. And of course along with the language novel concepts of kinship, social organization, and religion also spread.

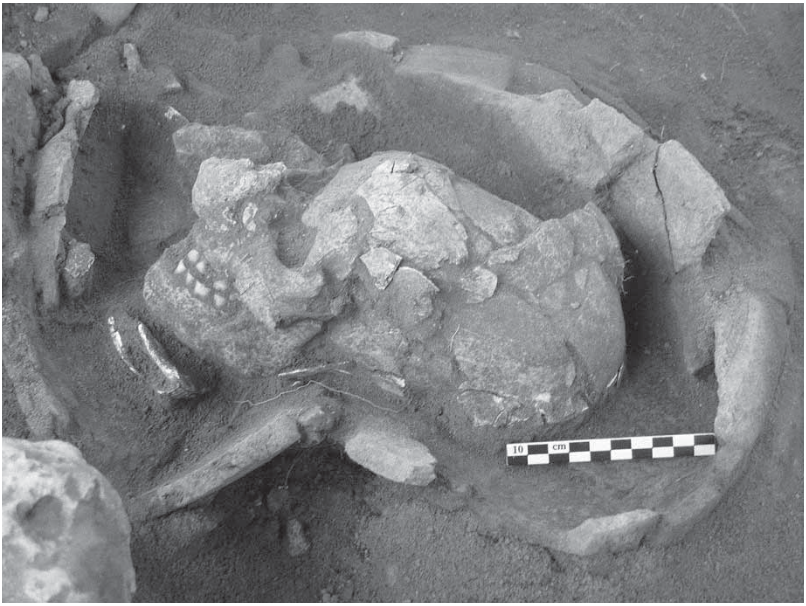

Fig. 18.5 Skull of an adult female inside a Lapita pot, Teouma. The flat-bottomed dish in Fig. 18.4 was used as a cover for this burial.

If the direct Lapita origin point cannot be determined archaeologically, we do know that Proto-Oceanic is a direct descendant of Proto-Malayo-Polynesian, the ancestral language for many Island Southeast Asian languages which would seem to have been spread rapidly across Island Southeast Asia associated with the again-rapid spread of Neolithic culture across that region around 4000–3800 cal BP (Spriggs 2011). Once more the association between a rapid spread of a Neolithic culture and a linguistic dispersal seems clear.

Although the pots do not generally move in the Lapita expansion, one material that clearly does is obsidian from Bismarck Archipelago sources (Summerhayes 2009). It is found in quantities that suggest continued exchange for some period of time through to central Vanuatu (Constantine *et al*. 2015; Reepmeyer *et al*. 2010). Beyond that in New Caledonia and Fiji, the numbers of pieces may simply reflect what was carried on initial colonizing forays (Ross-Sheppard *et al*. 2013; Sand and Sheppard 2000). Interestingly, obsidian from the Bismarcks is also found way to the west in Island Southeast Asia at this time, at sites in Sabah on Borneo and as surface finds in Cebu in the Philippines (Reepmeyer *et al*. 2011). This surely makes it one of the most widespread Neolithic exchange items in the world, with a distribution across 6000 km (Fig. 18.6). When Friedman (1981; 1982) originally categorized Lapita as a prestige goods economy, the only such item he could point to was obsidian. It has further been suggested that its appeal was as representing in some way the Lapita homeland from whence it derived and being implicated in maintaining links back to there (Green 1987). In Vanuatu, for instance, there were perfectly serviceable obsidian sources in the Banks Islands that were indeed discovered early in the Lapita occupation of that archipelago. They are, however, a small percentage of the obsidian at Teouma and at Makue on Aore, near Santo, the two earliest Lapita sites known in Vanuatu (for Makue: Galipaud and Swete-Kelly 2007; Galipaud *et al*. 2014). The preferred supplier remained the island of New Britain in the Bismarcks.

This does not, however, confirm obsidian as a classic prestige good. There is essentially only one formal tool type found in Lapita sites, the so-called graver, with a retouched point. Otherwise, obsidian artefacts consist largely of simple flakes, analysis of which does not suggest they were curated or conserved in any way that would imply intrinsic value, despite their wide distribution (Sheppard 1993). One possibility is that they were in themselves not what was being exchanged, but merely a by-product of that exchange. The gravers may be the clue, as they appear to have been used in body tattooing or scarification (Kononenko 2012). It is perhaps the tattooists who were engaged in a prestige activity that the obsidian is proxy for, rather than being a particularly prestigious good. As shown by the iconography on the pots, and presumably by the same on human bodies[3], rather than the movement of material goods it is the maintenance of long-distance symbolic relationships that was actually significant for underwriting the political economy in Lapita (Earle and Spriggs 2015). Similarly, Pechtl (this volume) argues that chert had little value in itself in LBK societies,

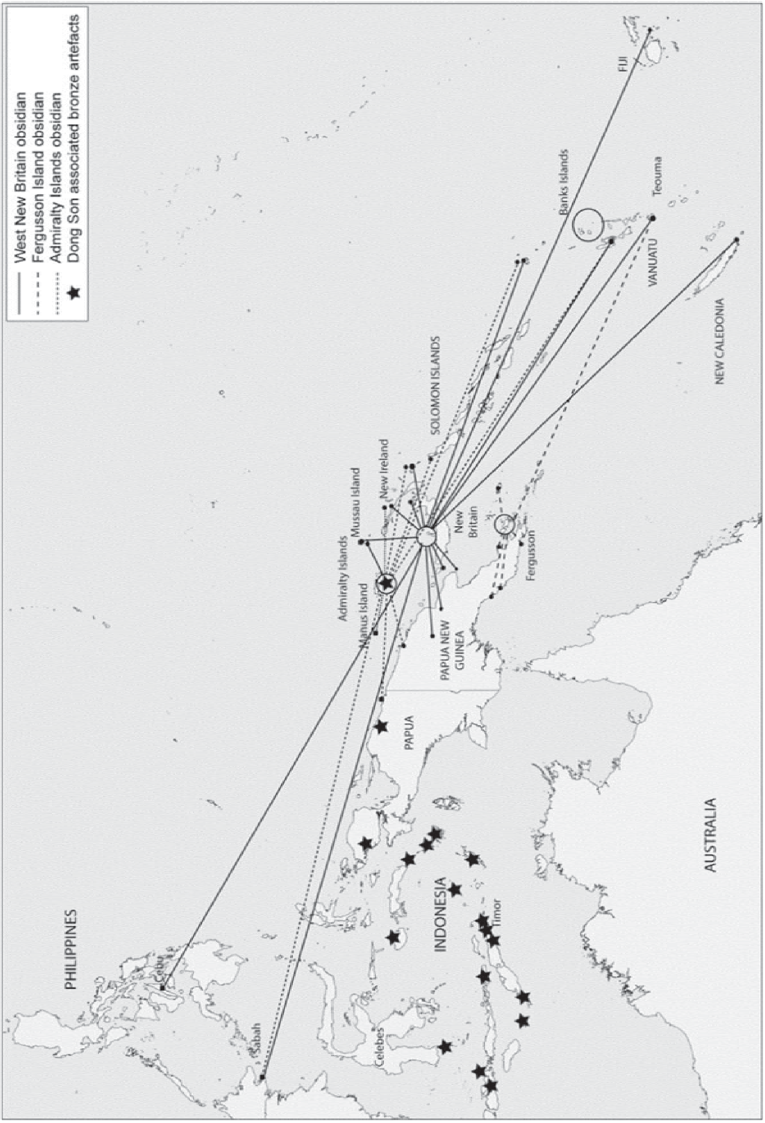

Fig. 18.6 The distribution of obsidian in the western Pacific and Island Southeast Asia c. 1000 BCE. The stars show the later distribution of Dong Son bronze drums and other associated bronze artefacts in the early centuries CE (courtesy of Wal Ambrose, amended by Richard Potter).

but was passed on as incidental to and as a proxy measure of intensity of social communication.

As noted recently elsewhere (Spriggs in press), one wonders if in fact the recent interest in archaeology in “things” and “thingness” has gone too far. What we glibly identify as prestige goods on the basis that they are exotic or highly decorated may in fact be merely props used as part of *prestige practices*, and signs of these rather than having any intrinsic value in themselves. As I have noted in that paper there are many such practices that would have had exchange value: being a boat-builder or navigator, the ability to mediate across languages and cultures that a scout or trader might possess, tattooing, wood carving, ritual specialisms of various kinds, healing and bone-setting, tactical skill in warfare and/or hunting, the magic of being the exemplary “first farmer” in a region, or of being a prospector and/or stone axe maker or metalworker. Being a chief is in itself a prestige practice, and one that has to be reinforced constantly through the performance of being and acting as a chief (cf. Earle and Spriggs 2015). Establishing a new settlement is also a prestigious act (cf. Van Wijk, this volume). It is time to give as much consideration to the performance of prestige practices as a bottleneck enabling direction and manipulation of the political economy as we do to control over material so-called prestige goods that we putatively identify in the archaeological record. The difficulty, however, is that many of these practices may be effectively archaeologically invisible; it is hard in the material record of either Lapita or the LBK to point to convincing archaeological evidence for hierarchical organization, something Earle and Spriggs (2015) have been grappling with in the case of Lapita.

The latest morphological comparisons (Valentin *et al*. in press) suggest that there was a significant population shift during Lapita which may indeed be implicated in its “disappearance” and subsequent more localized cultural expressions. The Teouma population shows morphological similarities with both modern-day Polynesians and Asian populations, whereas Late Lapita and immediately post-Lapita populations across its Melanesian range were more similar to present-day populations within the Island Melanesian region. This population “replacement” occurred during Lapita, when overall populations were extremely small and could be swamped by a changed migration stream origin. The original Lapita migrants were thus directly Neolithic peoples from Island Southeast Asia and spread to the Polynesian limits of Lapita expansion. The easternmost populations were then largely isolated and provided continuity through to the present-day Polynesians. In Island Melanesia, however, within a very few generations, the migration stream shifted very largely to recruits from the populations already present in the Bismarcks and Solomons when the original Lapita migrants first arrived. Lapita was ultimately a lifestyle not a population, and a lifestyle presumably rapidly adopted by at least a portion of the pre-Lapita and originally non-Austronesian speaking peoples of the region. It is these acculturated groups, presumably to some extent intermarrying with the Asian-derived original Lapita migrants, who continued the migration stream into Remote Oceania and came to dominate the Later Lapita phenotype in places such as Vanuatu, New Caledonia, and Fiji. Tonga and Samoa at the far eastern edge of the Lapita distribution were relatively unaffected and the earlier phenotype continues there to this day.

In Late Lapita and immediately post-Lapita sites in Vanuatu and elsewhere elaborate, communal funerary rituals are replaced by simple and definitive inhumation, perhaps representing a shifting emphasis from generalized group membership to descent, where claims to land ownership were made on the basis of links back to known individual ancestors (Valentin *et al*. 2011; 2014; cf. J. Thomas 2001). As noted earlier, the pots also change to become largely plain and indeed “faceless”, with a fading away, too, of the more elaborate vessel forms associated with Lapita fine ware. This seems to start to occur immediately when Lapita reaches its geographical limits to the east in the Tongan and Samoan archipelagos of western Polynesia. It may have been the fact of exploration and targeted migration by the original bearers of the Lapita culture that maintained the homogeneity of the design system.

Once that initial push out into the unknown had reached its limits, the need for continued back-reference to the “homeland”, perhaps for spouses, for support in establishing settlements, for reinforcement of prestige through goods and practices, seemed to contract progressively across the Lapita range; the Bismarcks thus claim the latest as well as the oldest Lapita dates. Pottery designs became more localized as a result perhaps of increasing isolation, and the unity of the Lapita “supercommunity” (Gosden and Pavlides 1994, 168) was broken. Long-distance exchange ceased. There is also a question of how “acculturated” the later carriers of the Lapita migration really were, or—to put it another way—how committed they may have been to maintaining its worldview and iconography.

Before the new biological evidence was available as to the origins of the Lapita peoples, I had already referred to an increasing “Melanesianization” of cultures in Island Melanesia post-Lapita (Spriggs 1997), and Earle and Spriggs (2015) noted the archaeological evidence for an egalitarian turn in the political economy after the end of Lapita to a much less hierarchical system. Symptomatic of this is the cessation of long-distance exchange;

maintaining it was seen as too costly for the benefits it may have originally given.

The initial Lapita expansion was driven by relatively small migrant groups bearing a rigid and homogeneous culture. They moved through and planted colonies among an existing set of populations in Near Oceania, then moved out into previously uninhabited island groups. The Lapita lifestyle was inherently attractive, with its greater range of material things coming from a distant and exotic place to the west, its new body culture and dress codes, its international iconography, new architecture, new ways of preparing, storing, and displaying food, i.e. a new cuisine (cf. Bickle, this volume), and its prestige language, along with the stories brought back to the homeland of new worlds out there to the east as colonization proceeded. No wonder it attracted "converts" anxious to join in the adventure. In a few generations such converts were the majority of the canoe crews and "married out" or genetically swamped the original migrants both in the homeland and in the colonies out as far as Fiji.

Inevitably, as communities began to settle in and expand, questions would have arisen as to why they were reproducing what was still perhaps remembered as an originally alien set of beliefs and practices, and perhaps also still benefiting the same apex families descended from the original "foreign" migrants. As Zeeb-Lanz and Haack (this volume) put it in relation to the end of the LBK, there was a "loss of function of the ritual, religious, and all-encompassing cultural value system". As they settled in to their new homes these second wave settlers may have also re-evaluated aspects of their own previous culture and social organization in a more positive light. In the Lapita homeland region itself this could have been through contacts with still non-acculturated groups that did not subscribe to a hierarchically ordered political economy. We might say that a shift (or even a reversion) in ethnicity occurred (cf. Pechtl, this volume). The end of Lapita could have been as much about a crisis in identity and power relations as it was the loss of an originally-imported iconography on pots; the two probably went together anyway (again, cf. Zeeb-Lanz and Haack, this volume). A new basis was needed for chiefly power; those who could not adjust would not have been able to maintain their authority.

If the comparison with the LBK were even partially valid, we would still have to admit that it may relate only to the Earliest LBK spread and the processes that immediately followed. We might expect an originally hierarchical but generally open and competitive society, where potential conflicts were defused by sending out well-equipped groups to scout new places to farm in a process of enclave colonization/leapfrogging, following a particular broadly east–west environmental niche (Hofmann, this volume). They may have been speakers of a single language or related group of languages. They would have subscribed to a rigid ideology or worldview, reinforced by the performance of funerary and other complex rituals. They would have, initially at least, maintained contacts back to their proximate homeland, witnessed by direct importation of materials from there (there are hints of this in Wilczyński, this volume) or by two-way exchange, as well as by any stylistic change occurring in step across a wide region. Pottery served as an "identity token" among the diasporic communities (Hofmann, this volume).

Recruitment of local populations would have started soon after arrival, and ongoing population movements would have involved—indeed demographically they would have required—greater proportions of such recruits as colonization spread westwards. This might be visible in recognizable cultural drift as the LBK spread. While the ideological rigidity was powerful enough to survive as a recognizably reproduced culture over time, innovation and elaboration occurred, initially still uniting large areas of LBK territory but perhaps becoming progressively localized over time. Analogy with the Lapita situation might suggest that the end of the LBK (or perhaps just the end of the early phases?) was simply the point at which the original ideologies that sustained its spread became so attenuated or transformed that they became archaeologically unrecognizable as similar to what came before. Alternatively, the end may have represented a conscious rejection of the previous political economies, with potential for conflict if this rejection was resisted (Zeeb-Lanz and Haack, this volume).

I have no idea if this notional summary of the LBK as-if-it-were-Lapita will have any resonance for European specialists. But in a way, any differences should be as instructive as the surely undeniable parallels that I have pointed up. One value of a comparative archaeology of such macroregional phases of conjuncture is that it will allow us to examine what happens when one or more parameters are different (cf. Spriggs 2013). How does this alter the trajectory of change? Do technologies of travel matter? Does it matter if movement is by land or river, as opposed to over open sea or by coasting? Does the type of subsistence economy make a difference? When does the degree of centralization of political power affect outcomes? These are all questions we can examine if we lift our archaeological gaze from our narrow regional and temporal specialisms and, like those early Lapita voyagers, scan wide and previously uncharted horizons.

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Notes

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[1] Vandkilde continues: “the social climate appears ‘extra hot’, foreign impulses are actively and creatively incorporated, and identities rapidly and profoundly change” (2007, 16–17). Hedeager (2000, 51) earlier made very much the same points, noting of such periods: “during a relatively short period of time a new ritual universe and a new cosmology were established”.

[2] I cannot follow Specht *et al*. (2014) when they attempt to deconstruct Lapita, arguing for it representing “the introduction of new cultural traits over several centuries”. The problem would largely seem to be one of imprecise chronology allowing a wilful reading of Lapita with the pre-ordained aim of “unpacking” the package, rather than a serious evaluation. An ongoing revolution in the precise dating of Lapita assemblages is likely to mean that there cannot in fact be a “several centuries” long pause in the Bismarcks while such traits were assembled (see Petchey *et al*. 2014).

[3] Geometric patterns within the designs representing human heads on the Lapita pots, as well as on occasionally modelled heads and possible figurines, appear to show tattooing patterns (Green 1979; Summerhayes 1998).

CHAPTER NINETEEN

A POSSIBLE POLITICAL STRUCTURE FOR THE LINEARBANDKERAMIK?

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In his closing discussion for a collection of studies that presented current research on the central European Early Neolithic by a group of younger scholars, Alasdair Whittle reflected upon the considerable scale of work that had been initiated since he began his own research on the Neolithic in the early 1970s (Whittle 2009). To the outsider the extent of that work, and the range of the accumulating results, are indeed daunting and the current collection of essays makes clear the variation that now exists in what was once seen as the relatively uniform cultural assemblage of the period. The comments that follow have been prompted by this collection and by my need to find a framework within which to begin to understand the burgeoning body of material.

Archaeologists are prone to ask what the material that they study represents. This normally means that they treat the material as if it were a record that signified (that is—as if it represented) the processes that had resulted in its formation. The ways in which many (but by no means all) of these formation processes focus upon human behaviour, and are believed to have operated in relation one to the other, are taken to signify the ways different systems of past social, cultural, and economic organization were structured. Based upon this kind of reasoning, the archaeological writing of history takes the form of narrative accounts that trace the continuities and the transformations that seem to occur in the processes that are believed to have given rise to the archaeological record. One implication is that the more of the record that we recover, and the more detailed and finer grained our analysis of that record becomes (with, for example, the current emphasis upon the recovery and analysis of biochemical signatures), then the more visible, and clearly defined, are the various processes out of which historical narratives might be constructed.

Whilst it might be reassuring to believe that our empirical investigations provide us with increasing amounts of information about past formation processes, it does not in fact follow that our understanding of the history of the times during which those processes operated will become any clearer. The historical dynamics of any period involve the complex interplay of forces that include, but are not reducible to, the formation processes that are recognized archaeologically, and whilst we might trace with some confidence the material residues resulting from certain human behaviours, our understanding of what might have motivated those behaviours and their consequent development remains obscure (we know people did things, but why they did them is often simply down to speculation). Both these issues pose a considerable problem for an archaeology that expresses a widely shared desire to "*explain* how the past came about" (Renfrew 1982, 5; emphasis original). Such explanations are normally expected to be delivered in terms of causation (Salmon 1982; 1998), be it the causes for the form of the archaeological record or for particular human behaviours, but as I have indicated the former does not explain how the past itself came about and we lack an empirical basis for the latter. In any case, it is surely naive to claim a single cause, or even a limited range of causes, for the rise of historical conditions, given that history is more accurately characterized as the contingent product of complex, non-linear systems (cf. Van der Leeuw and McGlade 1997).

Our current understanding of the Linearbandkeramik seems to exemplify these problems. We now know an awful lot more than we once did about the detail of this material assemblage, but it seems to me that our understanding of the history of sixth millennium central Europe is a great deal less clear. The early agricultural systems that occupied "the upland basins drained by the major river systems of north-central Europe and the flat lowlands of the North European Plain" (Bogucki 2000, 199) continue to be represented to us by the residual, macroscopic assemblages of domestic structures, burials, ceramics, and lithics, and with the recent addition of biochemical attributes and an increasingly refined radiometric chronology. The descriptions of these widely dispersed assemblages have shifted over the years from emphasizing their routine material cultural uniformity to an emphasis upon describing the locally diverse patterns upon which that uniformity supervenes (Modderman 1988), and whilst the papers in this volume are certainly successful in taking forward the task of describing that diversity and the formation processes indicated by these data, we still seem to struggle to find a satisfactory explanation for the history of the Linearbandkeramik phenomenon (with apologies to Vander Linden, this volume).

Earlier commentators imagined that the material uniformity that dominated their understanding of the Linearbandkeramik assemblage represented the result of (that is, was caused by) cultural regularities in human behaviour that had been transmitted by the rapid colonization driving an agricultural system across central Europe. For Childe (1957, 105) the observation that the "löss lands west and north of the Danube were first occupied by a Neolithic population whose whole culture down to the finest details remains identical from the Drave to the Baltic and from the Dneister to the Meuse" accommodated an historical account of "the simplest conceivable sort of farming", the environment of which meant that "the peasant was free to shift his hut and break fresh ground as soon as his former fields showed signs of exhaustion". The material then known was thus accommodated by an historical account, but the account did not follow logically from the material itself. Childe's concept of culture and of "nomadic cultivation that does look really primitive—such as the earliest food producers, undisciplined by environmental limitations, might be expected to invent" (Childe 1957, 105) derived from his assumptions about what life might have been like in that period, and within which he believed that the empirical evidence of the day fitted: it no longer does. My point is that however thinly we slice the evidence, and however detailed our descriptions of material variability, unless we have a conceptual framework (by which I mean critically informed assumptions) for characterising the historical processes that can accommodate these data then the material details will be more confusing than they are clarifying. We know that the surviving material no longer fits with Childe's concept of the Linearbandkeramik as the material representation of the culture of shifting agriculturalists, but how are we to make sense of the very complex indicators of "diversity in uniformity" with which we are now confronted?

The way forward, I suggest, is to stop treating the archaeological materials of the Linearbandkeramik as if they were a residual assemblage that is to be explained by reference to the motivations and processes behind its formation. In place of this kind of reasoning we could then treat this assemblage as the residual of material conditions that *enabled* certain forms of life, including forms of human life, to grow, develop, and reproduce. This means that we would start from the position of accepting that without these material conditions of possibility, the forms of life which characterize the beginnings of agriculture in central Europe would not, and could not, have existed.

All life makes itself, a process referred to as *autopoiesis* (Maturana and Varela 1980), and by focusing upon how life was made by means of its own development we side-step archaeology's preoccupation with the making of things and instead consider history as the making of different forms of life. This allows us to recognize that a distinction exists between the agencies of life that developed themselves, and did indeed make and transform things in the process, and the agencies of things that made such developments possible. Thus history emerges out of what Ian Hodder has referred to as the "entangled" relationships that have always occurred in the on-going existence of things (Hodder 2012).

It is from this general position that we can now understand the centrality of the process of metabolism in enabling all forms of life to sustain their own development. Metabolism requires that a boundary of a living system be maintained and that it is across this boundary that energy is derived from an external source to be imported and dissipated through the internal work of self-making. This has two important implications. First, forms of life are self-defining by means of the boundary conditions that they construct. Thus individuals at one level of boundary organization, cells or bacteria for example, will combine to create symbiotic or bio-cultural solidarities at another level of bounded organization, such as organisms or colonies. This "socialization" of different forms of life would seem to be a process that displays directionality: living structures have become more complex over time. Second, information concerning both the location and form of external energy sources, and the internal mechanisms of boundary maintenance and self-development, must be recognizable to, and acted upon by, any process of autopoiesis. This means that, at a most basic level, the existence of consciousness as the means of recognising relevant information must be part of the definition of life (Thompson 2007). It is in the light of these observations that an archaeology of life (rather than an archaeology of things) should treat the archaeological data not so much as a representation of the processes of its formation (a record), but as fulfilling three quite broadly defined functions: (1) the information systems by which external energy sources might have been assessed and monitored, (2) the internal information systems by which a form of life defined its own creation and boundary conditions, (3) the technologies employed to access the necessary sources of energy, and to store, allocate, and dissipate that energy in the processes of autopoiesis.

Forms of life certainly leave a material trace, a record, of their existence because they have material effects, and as I have sketched it here, archaeology has traditionally been concerned to elucidate the traces associated with various forms of humanity. These traces, however, mainly attest to the maintenance and elaboration of the three functions that I have just listed above. Consequently the historical maintenance and development of material conditions was a process that sustained the niche conditions that were colonized by, and therefore sustained, particular forms of life. From this perspective the variable assemblages of the Linearbandkeramik can usefully be considered as the niche conditions that enabled the development of early agricultural systems in central Europe. That these niche conditions display a broad similarity whilst being locally developed, before eventually fragmenting into greater levels of local diversity, seems to be the main theme traced by the history of the Linearbandkeramik.

The approach that I am attempting to outline places human history firmly in the context of natural evolution, without making the mistake of claiming that such a history could have resulted from a kind of biological reduction and genetic determinism. Complex forms of life, such as human solidarities of one kind or another, have always built their own histories with reference to the information and energy conditions that were available to them, an understanding that locates the discipline of archaeology, and indeed the other social sciences, among the broad spectrum of life sciences. However, none of this relatively abstract reasoning matters if it does not provide us with the basis upon which to build an understanding of the uniformities and the range of diversities that are examined in the current collection of essays.

The transition from hunter-gatherer to agriculturalist did indeed involve a major structural transformation in the boundary conditions across which the exchange of energy passed and information was extracted that sustained these two different kinds of bio-cultural systems. Whereas hunter-gatherer systems maintained an energy transfer across a boundary between plants and animals on the one side and the human community on the other, agricultural systems can be described as having evolved a two-stage exchange of energy, one from the fertility of the land that was transferred and stored in the managed bodies of animals and plants (domesticates), the other from the energy that had been stored in those domesticates to the processes of human consumption (Barrett 2011). This allowed for greater variations in energy consumption defining differences between particular sections of the human population. Indeed, it was by means of accumulating reserves of energy in the biomass of domesticates that its differentiated consumption at such temporally and spatially regulated events as feasts became possible for agriculturalists. Compliant with this development was the shift from hunter-gatherer information systems that monitored the spatial and seasonal distribution of resources that were directly available for appropriation (with some attendant, but limited, storage potential), to the agricultural information systems that circumscribed the cultivation plots and grazing lands from which the energy stored in the crops and domesticated animals was derived, and thus maintained the rights of access to those lands as well as the mechanisms by which that food energy was then distributed and dissipated through human consumption. It is therefore hardly surprising that a change in the structure of language should have accompanied the development of these agricultural systems in Europe: they simply had different structural relationships to talk about. The transformation from one system to the other, from hunter-gatherers to agriculturalists, must have necessitated not only the availability of stocks of domesticates but also, crucially, the availability of land that could sustain the life cycles of these domesticates and thus originate the flow of energy from land fertility to people via managed plants and animals (Barrett 2014). This raises the important but little discussed question of the origin and extent of cleared and useable land, marking the necessary available energy from which the more complex Linearbandkeramik system could have arisen (cf. Kalis *et al.* 2003). This would imply that a level of continuity in patterns of landscape management must have existed across the transition from hunter-gatherer to agricultural land-use (cf. Gronenborn 1999, 126ff.).

Both hunter-gatherer and agricultural systems were therefore reliant upon maintaining the different exchanges of energy, which, among agriculturalists, meant that the rights to areas of workable land and to stock had to transcend that of any one generation (cf. Meillassoux 1972). Obviously land cannot be transported, and given the labour and resource invested in the continuing fertility of the kinds of cultivation plots described by Bogaard (2004) we must expect settlement longevity to have been the norm, to the extent that any suspicion that the longhouses of the Linearbandkeramik were anything other than long-lived, multi-generational structures should, by now, be seriously questioned.

A corporate identity tied to land rights therefore had to be maintained, and the suggestion that the Lévi-Straussian concept of "house" societies might be applicable in the Linearbandkeramik case is important (Lévi-Strauss 1982; Borić 2008). This would imply that corporate membership was organized with reference to the house rather than with reference to the lineage: "it is not the individuals or the families that act, it is the houses, which are the only subjects of rights and duties" (Lévi-Strauss 1982, 173). This would make the house the central container of information relating to rights and identity, as well as implying that the house recruited members through marriage, biological reproduction, and alliances. The Linearbandkermik longhouse, as a bio-cultural unit, bounded the two-fold exchange of energy—from land fertility to domesticated plants and animals, and from domesticated plants and animals to human consumption—as well as rights to additional mineral and timber resources. The house as a biologically sustainable unit therefore extended beyond the longhouse structure and its surrounding "yard", although the form of the longhouse would have been the material manifestation of the viability and success over time of that living system (cf. Pechtl 2009). Those longhouses that increased in size, or the numbers of longhouses that accrued to form settlement clusters (Rück 2009), registered the success of houses in forming alliances to increase their membership and with it their access to resources. This would seem to be what happened at Vaihingen an der Enz where, it is claimed, the lengthy and complex settlement history developed through the aggregation of five longhouse clusters, each distinguishable by the distinctiveness of their ceramic and lithic traditions, and where each cluster maintained its traditional land rights with the result that "different house groups cultivated areas at differing distances from the settlement" (Bogaard 2012; Bogaard *et al*. 2011, 495).

The centrality of the longhouse structure as the material manifestation of moral authority cannot be overstated, and this returns us to Bourdieu's commentary on such structures as "the principle locus for the objectification of the generative schemes [...] between things, persons and practices" (Bourdieu 1977, 89). This does not mean that the spatial organization of the longhouse interior can be treated as if it were the map of an ideal scheme of spatial categories, as Bourdieu's own study of the Kabyle house (Bourdieu 1990, 271–283) has led some to believe. Instead the house was the material condition that enabled, through the various practices that were played out in the fluidity of movement, congregation, and activity by its occupants, the continuous "inculcat[ing] and reinforce[ing of] the taxonomic principles underlying all the [...] provisions of this culture" (Bourdieu 1977, 89). Thus the longhouse was a source of information that was accessed by living within it and in the company of others. The regional patterns of longhouse plans that are recovered archaeologically do not, for example, represent shared orientations that were determined by some abstract cultural principle, but were pragmatically achieved to ensure that a propitious path of approach and departure was followed by the occupants' own bodily movement, and thus its own feeling of security, evoked by reference to the longhouse as the manifestation of a wider cosmological order.

Whilst we should heed warnings against over-easy generalizations, given the increasingly complex and regionally diverse form of the Linearbandkeramik data, we might none the less consider that the various categories of archaeological data that are discussed in this volume are the manifestation of a Linearbandkeramik political system. Politics concerns the ability to demonstrate legitimacy for the appropriation and the consumption of resources that sustain a particular quality of life, very often at a cost to others. The central political institution of the Linearbandkeramik was the house, to which members could be recruited by various forms of alliance but centrally by marriage and perhaps by adoption. These forms of recruitment exploited the flexibility offered by "house" societies to build "house"-based corporate groups that did not depend for their legitimacy upon the participants establishing a common genealogical heritage. Corporate groups could therefore be constructed relatively rapidly and political growth was played out by recruiting membership to the "house" group with the potential of increasing its related rights over land, stock, and material resources, a process that might have depended upon principles of patrilocal residency (Hedges *et al*. 2013, 367). Exchange networks linking house clusters clearly existed, but these would not have formed the basis for political authority in the same way as some have claimed to see in the political structures of the European Bronze Age and Early Iron Age (Frankenstein and Rowlands 1978; Rowlands 1980; cf. Friedman and Rowlands 1977).

The archaeology of the house as the political institution of the Linearbandkeramik thus embraces the conditions that the living communities of people, plants, and animals inhabited in such ways as to enable early agricultural life to exist in the sixth millennium of central Europe. The exchanges of energy from land through plants and animals to people, the technologies that dissipated those energies (such as ovens and ceramic assemblages for food service), and the access to other resources (such as lithics) and technologies (through traditions of learnt information), were all contained by this institution. It is for this reason that "across the burial grounds [...] in central Europe, and indeed beyond in the wider LBK distribution, the household does not show up in any easily recognizable or obvious way among the mortuary populations" (Hedges *et al*. 2013, 387). Human burials were the rituals that responded to interpersonal loss (Hofmann 2009), whereas the political continuity of the house was lived in its occupancy across the generations and its history was contained in the continuity of its physical structure (cf. Bloch 1992): that history was not projected into a genealogy of the dead, for why should it be?

If these comments do have validity then they imply that it was the Linearbandkeramik assemblage that made the early agriculture of central Europe possible. The distribution of that assemblage is not the signifier for a standardized corpus of cultural behaviours that were carried across Europe by human colonisers, rather it arose instead as a self-organising system comprising newly available breeds of plants and animals, a growing human population, available land, and additional material resources. That system was sustained and grew by the extraction and storage of new sources of energy from an external environment and utilized new sources of information through a house-based political structure, before collapsing in the fifth millennium. It is therefore surely understandable that this system was variable in the ways that it evolved locally during the sixth millennium.

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